



**FINAL
SITE INSPECTION PRIORITIZATION REPORT
METZ METALLURGICAL CORP.
SOUTH PLAINFIELD, MIDDLESEX CO., NEW JERSEY**

CERCLIS ID No.: NJD002195303

VOLUME 1 OF 3

**EPA Contract No.: 68-W5-0019
TDD No.: 02-99-08-0078
Document Control No.: START-02-F-03738**

JULY 2000

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

**Region II Superfund Technical Assessment and Response Team
Roy F. Weston, Inc.
Federal Programs Division
Edison, New Jersey 08837**





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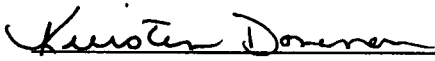
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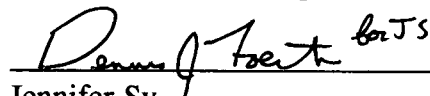
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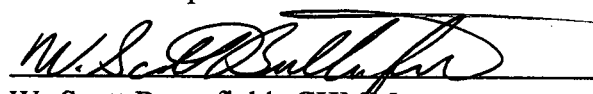
SUBMITTED BY:


Kiersten Dorneman
START Project Manager

Date 24 July 2000


Jennifer Sy
START Group Leader

Date 24 July 2000


W. Scott Butterfield, CHMM
Site Assessment Team Leader

Date 7/24/00

SITE SUMMARY

The Metz Metallurgical Corp. (Metz) site (CERCLIS ID No. NJD002195303) is an 11.9 acre site located in a light industrial area at 3900 South Clinton Avenue, in South Plainfield, Middlesex County, New Jersey (Ref. No. 1). A site location map is presented in Figure 1. Approximately 9.2 acres of the site is owned by Degussa Corporation, Metz Division and approximately 2.6 acres of the site are leased by Degussa from S. Sorce (Ref. Nos. 2, p. 1; 3; 4, pp. 7, 43, 67). The site is bordered to the north by Warner-Jenkinson Co., Inc. and Wade Avenue; to the east by South Clinton Avenue; to the south by American Metal Warehouse Co., Inc. and a paved area owned by Degussa Corporation; and to the west by a wooded area and drainage ditch. The precious metals refining facility is currently active with a well-maintained fence (Ref. No. 2, pp. 1-3, 5; 3; 4, p. 141).

Metz Metallurgical Corp. consists of three buildings, A through C. Building A houses all manufacturing operations. Building B is utilized for offices and for storage. Building C is an industrial warehouse located on the property leased from S. Sorce. A site map is presented in Figure 2. There are on-site production wells that provide non-contact cooling water for the facility. According to information submitted by Metz to the New Jersey Department of Environmental Protection (NJDEP), the facility maintains 12 above ground storage tanks which include two nitric acid tanks with capacities of approximately 3,500 and 6,000 gallons, two sodium hydroxide tanks with capacities of approximately 6,000 and 11,000 gallons, one reagent grade hydrochloric acid tanks with a capacity of approximately 5,000 gallons, one low grade hydrochloric acid tank with a capacity of approximately 7,000 gallons, one formaldehyde tank with a capacity of approximately 6,000 gallons, one oxygen tank with a capacity of approximately 7,000 gallons, two nitrogen tanks with capacities of approximately 530 and 11,000 gallons, one ammonia tank with a capacity of approximately 400 gallons, and one brine tank with a capacity of approximately 1,200 gallons. All the above ground tanks were observed by the NJDEP to have concrete or cinder block diking (Ref. Nos. 2, p. 5; 3, p. 545; 4, pp. 7, 162, 652, 653, 655, 656).

In 1966, G-M Associates purchased undeveloped land from New Era Corporation and began operating a precious metal manufacturing facility. On 24 January 1978, Metz Metallurgical Corp. purchased the property from G-M Associates and continued the precious metal manufacturing operations. Two additional lots were purchased by Metz on 12 November 1974 and 15 December 1981. The former lot was undeveloped prior to Metz's purchase, and the latter was utilized as a storage and garage area by general contractors (Ref. No. 4, pp. 7, 75).

Metz is a precious metals manufacturer and refiner. The majority of its operations involves extracting and refining silver which is received in the following forms: high purity bullion, off-grade bullion, coin and sterling silver, metal powders, silver slurry, silver chloride and silver sulfide slurry, photographic and metallic chip, and returned off-spec product. The silver is processed and refined into wire, ribbon, coil, powder, flakes or other forms depending on the desired product, and sold to the photographic, electronic, aerospace, and chemical catalyst manufacturing industries. Other metals such as cadmium, gold, platinum, and copper are either alloyed with silver or refined in smaller quantities (Ref. No. 4, pp. 7, 94-114).



WESTON
MANAGERS DESIGNERS/CONSULTANTS

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FEDERAL PROGRAMS DIVISION

EPA TM

C. Moyik

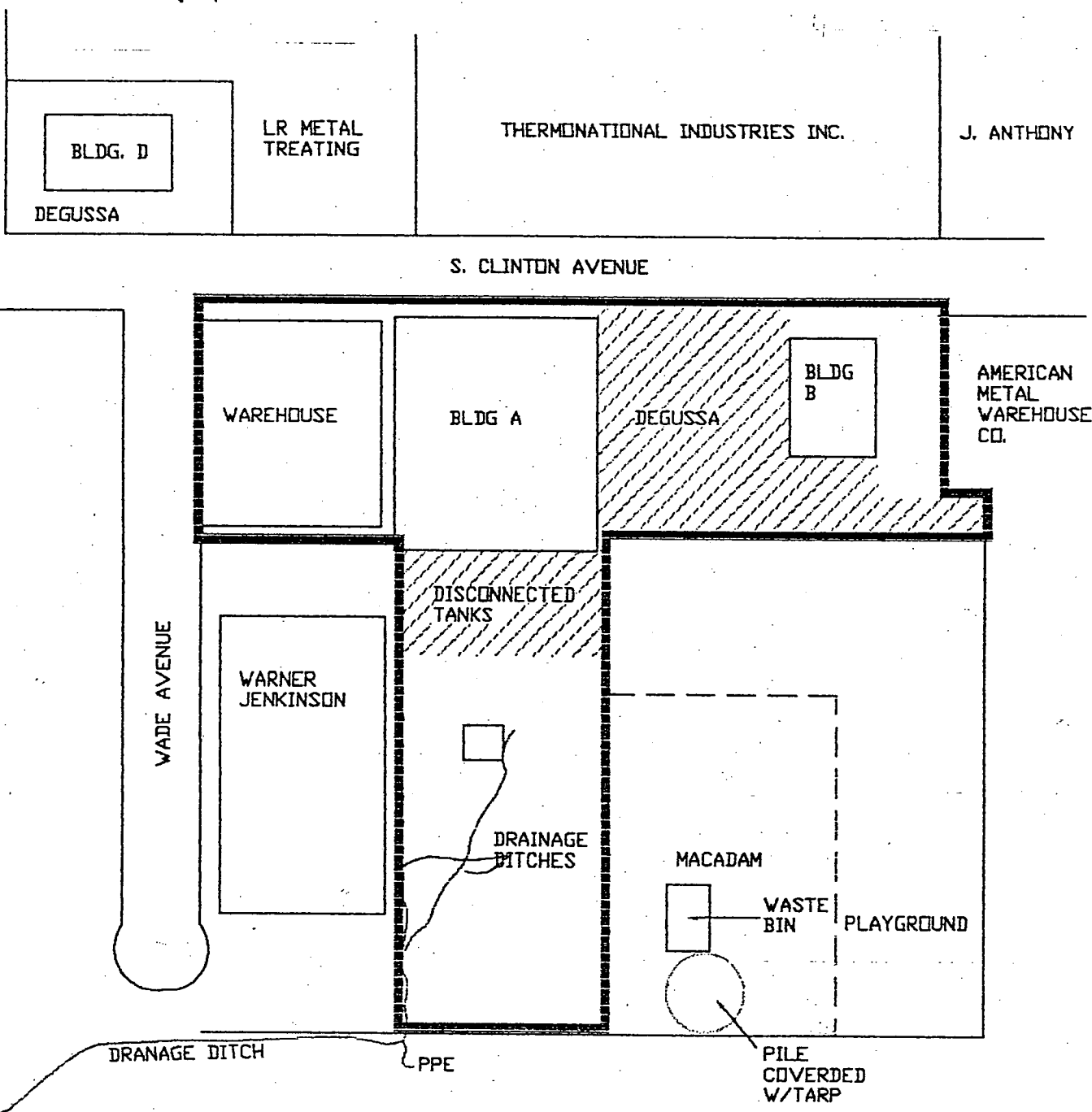
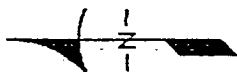
Figure 1-
Site Location Map

IN ASSOCIATION WITH RESOURCE APPLICATION, Inc.
C.C. JOHNSON & MALHOTRA, P.C., R.E. SARRIERA ASSOCIATES,
PRC ENVIRONMENTAL MANAGEMENT, AND GRB ENVIRONMENTAL SERVICES, INC.

START PM

K. Dorneman

Metz Metallurgical



PAVED AREA



Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION

IN ASSOCIATION WITH PRC ENVIRONMENTAL MANAGEMENT, INC.,
C.C. JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC.,
R.E. SARRIERA ASSOCIATES, AND GRB ENVIRONMENTAL SERVICES, INC.

FIGURE 2 - SITE MAP
METZ METALLURGICAL CORP
SOUTH PLAINFIELD, NEW JERSEY
DECEMBER 1999

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

CONTRACT# 68-W5-0019

DRAWN BY: J. HAMPTON JR.

EPA TASK MONITOR: C. MOYK

START PROJECT MANAGER: K. DORNEMAN

Metz also maintains 12 underground storage tanks (USTs) registered with the NJDEP as emergency spill tanks under UST No. 0099525. These USTs are safety catchments (sumps) to contain any large spills inside the facility. The facility initially registered 31 tanks containing silver, silver nitrate, sodium hydroxide, hydrochloric acid, and sulfuric acid. On 12 February 1991, Metz requested that some of the tanks, which were registered incorrectly, be removed from the listing. In August 1999, NJDEP removed 19 of the initially registered tanks from the registry (Ref. Nos. 4, pp. 118, 119, 209, 210, 657-661; 6).

The wastes generated from on-site operations include heavy metals and spent solvents from the recovery of precious metals and degreasing/cleaning operations. The facility discharges non-contact cooling water and storm water under NJDEP Facility Wide Permit (FWP) No. NJ00010, through an unlined drainage ditch and catch-basin, to an unnamed tributary of Bound Brook. Waters from Metz's wastewater treatment plant, containing salts, formaldehyde and methanol, are discharged to the Middlesex County Utilities Authority (MCUA) sewer system, under Permit No. 24055 (Ref. Nos. 7, pp. 72, 78, 80; 9, pp. FAC1, Q1, HH1; 16).

On 12 June 1980, NJDEP conducted an inspection at Metz and observed an unpermitted discharge occurring at the rear of the facility. According to NJDEP personnel, laboratory analyses of a discharge sample collected during the inspection revealed high concentrations of volatile organic compounds, including xylene and chlorobenzene, high COD and suspended solids, a pH of 10.2, and turbidity of 152 units. NJDEP recommended that the facility cease the unpermitted discharge, redirect the effluent to the sanitary sewer, or obtain a National Pollutant Discharge Elimination System (NPDES) permit (Ref. No. 4, pp. 225, 226).

Metz filed a Resource Conservation and Recovery Act (RCRA) Notification of Hazardous Waste Activity form as a treatment, storage, and disposal facility (TSDF) on 15 August 1980 (Ref. No. 8). According to a 5 December 1983 letter from Metz to NJDEP, the United States Environmental Protection Agency (EPA) reclassified the facility from a TSDF to a generator of hazardous waste in July 1982. Metz requested similar reclassification by NJDEP (Ref. No. 4, pp. 216-220). On 13 April 1984, NJDEP delisted Metz as a TSDF. The facility was reclassified as a generator of hazardous waste and an existing Industrial Waste Management Facility (IWMF) (Ref. No. 4, pp. 222, 223).

Four RCRA inspections were conducted from 1982 to 1998 as a result of Metz's generator status. On 5 February 1982, a TSDF inspection was conducted by NJDEP at Metz. The inspector noted that the facility did not have a written inspection schedule, contingency plan for emergency procedures, closure and post-closure plans, or estimate of the cost of closing the facility (Ref. No. 7, p. 1). On 26 and 27 April 1984, and on 2 July 1987, NJDEP performed generator inspections. During the 1984 inspection it was noted that the feed pipes for the cyanide destruct unit tank (T01) were disconnected and no longer in use. In addition, drums containing waste oil, waste freon TF, and leaking capacitors were also found within the facility's manufacturing buildings (Ref. No. 4, pp. 180, 181, 186, 216). The inspection revealed that Metz does not conduct semi-annual drills involving employees and local authorities in an effort to test emergency response capabilities. In addition, the facility's contingency plan does not include a maintained list of all emergency equipment at the facility (Ref. No. 7). On 27 April 1998, a RCRA Hazardous Waste Compliance Evaluation Inspection was conducted by EPA. During the inspection, Metz indicated that the facility no longer qualifies as a large quantity generator.

The inspection noted that the lids of three 5-gallon containers containing barium waste were not tightly closed and the list of emergency coordinators in the Contingency Plan was not current. A NOV was subsequently issued to Metz on 12 August 1998, requesting a written response explaining how the violations have been corrected. Metz submitted a letter on 18 August 1998 indicating individuals directly involved with the storage of hazardous waste were retrained, and the Contingency Plan was revised even though the facility has been a small quantity generator since June 1995 (Ref. No. 7).

On 25 August 1982, approximately 1,000 gallons of 45% potassium hydroxide was released from a fiberglass storage tank during filling operations. The substance reached the ground and a drainage ditch adjacent to the rear of the facility via storm drains. The released potassium hydroxide was pumped back into the delivery truck and into the plant's wastewater facility. The affected areas were flushed with water until neutral. The wash waters were treated at the facility's wastewater treatment facility. A Notice of Violation (NOV) and Offer of Settlement was issued by NJDEP (Ref. No. 4, pp. 228, 229, 420-422).

A caustic solution was discharged directly to MCUA sewer system without proper pH adjustment on 30 November 1982. This high pH solution reacted with some low pH material in the sewer lines producing some oxides of nitrogen (Ref. No. 4, p. 231).

From 1984 to 1991, various inspections and incident reports noted unpermitted releases to the atmosphere by Metz. On 26 December 1984, an inspection was conducted by the Middlesex County Health Department (MCHD) during which excessive black smoke emissions were observed. As a result, a warning NOV was issued on 24 January 1985 (Ref. No. 4, p. 393). On 10 August 1985, a fire occurred in a packed spray tower that serviced several acid reactors at the facility. After the fire was extinguished, NJDEP noted a large hydrochloric acid tank fuming, and the presence of a vapor cloud within the property lines (Ref. No. 4, pp. 416, 417). On 4 October 1985, the facility released approximately 2.04 pounds nitrogen oxides (NOX) to the atmosphere in 14 minutes. An Administrative Order (AO) and Notice of Civil Administrative Penalty Assessment was issued for violation of operating an overcharged vessel, running the reaction too rapidly, and operating the scrubber with low liquor pH (Ref. No. 4, pp. 394, 401, 402). On 19 January 1987, smoke was released for a period of 24 minutes from the seneca baghouse when cartridges inside the baghouse ignited (Ref. No. 4, pp. 395). On 22 and 26 September 1988, less than two pounds of ammonium chloride was released from New Jersey Stack No. 054 (Ref. No. 10). On 2 and 3 May 1989, material contained in an oven located in the Refining Furnace Room caught on fire and released large quantities of smoke (Ref. No. 10). On 30 October 1989, an unknown amount of NOX was released but contained within the facility (Ref. No. 4, p. 396). On 14 September 1990, MCHD conducted an inspection and issued an NOV for failure to immediately notify NJDEP of a release of metal particulates which resulted in a citizen complaint and posed a potential threat to public health and the environment (Ref. No. 4, p. 397). On 11 December 1990, approximately 15 pounds of silver powder/flake was released to the atmosphere as a result of equipment failure (Ref. No. 4, pp. 398, 399). On 29 January 1991, an investigation was conducted by the Middlesex County Air Pollution Program and a NOV was issued to the facility. The NOV charged Metz with permitting an acid-type odor to be transported beyond property lines resulting in a citizen complaint (Ref. No. 4, pp. 388-391, 400).

A groundwater investigation was initiated at Metz in September 1985 evaluating the integrity of below-grade structures. Seven monitoring wells were installed by Empire Soils Investigations, Inc. from 16 through 25 September 1985. The wells range from 49.3 to 63.0 feet (ft) below ground surface. On 19 and 20 November 1985, the seven monitoring wells were sampled by Environics Inc. for the Priority Pollutant metals. According to background information, antimony, lead, silver, zinc, cadmium, and copper were detected at low levels (Ref. No. 4, pp. 156, 160, 164-168).

On 30 January 1986, Metz sold the real estate and business to Degussa Ag. As a result of this sale, Metz submitted the General Information Submission and the Site Evaluation Submission for the Environmental Cleanup Responsibility Act (ECRA) to the NJDEP on 3 February 1986, and on 26 February 1986, respectively (Ref. No. 4, pp. 69-86, 88-169). Subsequently, on 23 July 1986, Metz entered an Administrative Consent Order (ACO) with the NJDEP to carry out the ECRA investigation. The ACO determined the ECRA program requirements for the facility (Ref. No. 4, pp. 428-434).

The ECRA investigation included extensive soil and sediment sampling from seven areas of concern, including former drum and equipment storage areas (Areas A through D), the drainage ditch receiving the NJPDES outfall (Area E), the former UST (Area F), and the soils in the vicinity of monitoring well MW-105 (Area G). Between 1 April and 27 April 1987, samples were collected to either identify or delineate known contamination. Various metals were detected within ECRA Areas A through E, and petroleum hydrocarbons were found in Areas A through F (Ref. Nos. 11, pp. 3, 5-26; 12, pp. 1, 2). Subsequent surface and subsurface soil and sediment sampling events were conducted in September 1987, February 1988, May 1988, November 1989, and April 1990 to assist the facility in delineating the contamination for the planned cleanup in each area. Petroleum hydrocarbons were found in Areas A through D and F. Areas A, C, and D contained silver. Cadmium and copper were reported in Areas A and D. Area A also contained chromium and nickel. On 10 April 1990, soil was excavated to bedrock in Area F, post-excavation sampling was conducted, and petroleum hydrocarbons were detected. In addition to the identified areas of concern, southern and western facility perimeter samples were collected and identified silver, cadmium, copper, and petroleum hydrocarbons (Ref. No. 4, pp. 493, 505, 506, 510-515, 517, 519-522, 541, 542, 553-596). In February 1988, groundwater samples were collected from the seven on-site monitoring wells and two production wells. Trace concentrations of cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc were detected at concentrations below the method detection limit. Arsenic was detected at the method detection limit in two wells (Ref. No. 4, pp. 524-539). During November and December 1990 and June and July 1991, sediment was excavated from Area E, and post-excavation samples were analyzed for silver at 30 foot intervals. Analytical results indicate that there is no detected residual silver contamination with the exception of sediment sample 150 R. The excavated soil was shipped to Pennsauken Solid Waste Management Authority, New Jersey (Ref. Nos. 14, pp. 1, -20, 23; 19, pp. 3-8). Between May and July 1991, soils were excavated from the southern and western facility perimeter locations PS-1 through PS-3. Post-excavation samples were collected from the base of the excavation and from the sidewalls. Perimeter location PS-2 contained silver. Background information indicates that additional excavating and sampling occurred at location PS-2 in June 1991; however, the results are unavailable (Ref. No. 19, pp. 9-11). In May 1992, the Final

Report for ECRA Case No. 86108 was prepared by CH2M Hill and submitted to the NJDEP. The report proposes that NJDEP issue a negative declaration, close the ECRA case, and terminate the financial assurance requirements (Ref. Nos. 14, pp. 1, 8-9, 13; 15, pp. 2-4).

Approximately 12 ounces of silver chloride were discharged to the NJPDES permitted outfall (Permit No. NJ0034835) to the drainage ditch on the western boundary of the facility on 14 February 1986. Silver nitrate had vented to the roof, combined with melting snow and excess salt, and formed silver chloride. The runoff from the roof entered the NJPDES outfall. Internal lab analysis from a sample collected at the outfall revealed silver chloride at a concentration of 55.9 parts per million (ppm) (Ref. No. 4, pp. 72, 133).

Seven monitoring wells and the production well were sampled between 31 March and 2 April 1986 for full EPA Priority Pollutants, plus 40. Zinc, cyanide, carbon tetrachloride, chloroform, 1,1-dichloroethene, tetrachloroethene, 1,1,1-trichloroethane, trichloroethene, trichlorofluoromethane, total xylenes, and bis(2-ethylhexyl)phthalate were detected in the groundwater beneath the facility. On 12 May 1986, monitoring well MW-105 and the production well were resampled and analyzed for volatile organic compounds. Laboratory reanalysis revealed the presence of various volatile organic compounds in the groundwater (Ref. No. 4, pp. 439-461).

Three ECRA inspections were conducted on 24 and 25 June 1986, 29 May 1991, and on 29 September 1992 by NJDEP under Case No. 86108. Deficiencies in the sampling plan submitted for the investigation were reported and the corresponding corrective measures were determined. In 1991, it was noted that acid was released but contained in the retention basin. The liquid was flushed with water, pumped into a tank truck, and discharged into the facility's wastewater treatment system for neutralization. During the final inspection NJDEP noted that all work required under the cleanup approval letter has been completed (Ref. No. 7). NJDEP granted no further action to Metz for each area of concern and determined that the cleanup was completed on 25 October 1992. The facility was released of its financial assurance requirements on 28 October 1992 (Ref. No. 15, p. 1).

On 31 March 1988, approximately 100 gallons of a corrosive liquid (pH = 12) spilled onto the ground from leaking drums located adjacent to the northwest corner of building A. The soil was excavated until a pH less than 9 was obtained. The excavated soil was classified as nonhazardous and was treated and disposed of through Chemical Management Inc. (Ref. Nos. 4, pp. 235-236; 10).

On 9 January 1989, approximately 300 pounds of silver nitrate liquid was released onto the plant roof as a result of a fractured pipe. According to facility personnel, approximately half of the spill was contained and recovered on the roof. The remaining material reacted with chloride, forming insoluble silver chloride. The insoluble silver chloride flowed down roof drains and into the NJPDES outfall. Temporary dams were constructed in the drainage ditch to contain the spill and plant processes were shut down to minimize the water flow. The contaminated water was pumped to a tanker truck and transported back to the facility for silver recovery. Approximately 2 cubic yards of sediment were removed from in between two of the dams and stored on-site in 55-gallon drums. Analysis of ten samples collected from the drainage ditch indicated that the maximum concentration of silver found in the sediment was 10 milligrams per kilogram (mg/kg) (Ref. No. 4, pp. 238-244, 545-547). Subsequently, according to the Report of Analytic Results prepared by CH2M Hill, twenty sediment

samples were collected from the drainage ditch receiving the NJPDES outfall on 16 March 1989 and analyzed for silver content. An additional four sediment samples were collected on 6 April 1989 to determine the endpoint of silver migration in the receiving drainage ditch. The sample results are not reported (Ref. No. 4, pp. 544, 546, 549, 551).

On 30 March 1989, approximately ten gallons of heat transfer fluid, Therminol 55, was released from a roof tank at the facility. Approximately 80 to 90% of the material was absorbed with sawdust, booms, and pillows. The remaining oil reached the NJPDES outfall via the roof drains. The oil that reached the NJPDES outfall was contained with oil absorbent booms set downstream of the outfall by the South Plainfield Fire Department (Ref. No. 4, p. 248).

Less than 100 pounds of silver chloride was released from the facility into a drainage ditch receiving a NJPDES discharge through the plant's non-contact cooling water on 13 September 1989. Upon receiving notification of the release, Metz shut the plant down, halted the flow of cooling water to the drainage ditch, and installed two dams, one on Metz property, and one in the receiving stream at the end of Century Avenue. The contaminated water contained by the temporary dams was discharged to the facility's wastewater treatment plant to recover the silver content. As a result of this incident, 18 sediment samples were collected by CH2M Hill on 22 September 1989 and analyzed for silver to determine extent of contamination. Silver was detected in all sediment samples collected with the maximum concentration in sample SS-4 at 3.89 mg/kg, located 575 feet downstream from the northwest corner of the property (Ref. No. 4, pp. 250-252, 547-551).

On 15 September 1989, the NUS Corporation under EPA's Field Investigation Team (FIT) contract prepared a Potential Hazardous Waste Site Preliminary Assessment Report. The report recommends that the site be given a "high priority," including an on-site inspection and multi-media sampling event be performed (Ref. No. 4, pp. 188, 206, 207).

A Discharge Surveillance Inspection was conducted on 27 March 1991 by the NJDEP. The facility was rated as conditionally acceptable. It was noted, however, that the USTs were not registered, housekeeping practices should be improved, and piles of excavated soil were uncovered. As a result of Metz's failure to renew its UST registration, a field NOV was issued (Ref. No. 4, pp. 19, 254-256, 436).

NJDEP established the following site-specific cleanup levels for on-site and off-site locations in a 26 April 1991 letter to the facility's environmental consultant. Cadmium was established at 110 and 3 parts per million (ppm), copper at 1,000 and 170 ppm, and silver at 200 and 5 ppm. Nickel and chromium cleanup levels were 100 ppm for both on- and off-site locations. Petroleum hydrocarbon concentrations were 15,000 ppm and not applicable for off-site locations, and base neutral compounds concentrations were dependant upon the presence or absence of carcinogenic polycyclic aromatic hydrocarbons. In addition, NJDEP granted no further action required for some of the ECRA areas of concern, including, the historical drum storage area (Area B), the historical drum and equipment storage area (Area C), the equipment storage area (Area D), the former UST (Area F), the soils in the vicinity of MW-105 (Area G), and the waste piles (excavated soils) (Ref. No. 12, pp. 1, 2). On 6 August 1991, NJDEP granted a "no further action" for the ECRA cleanup activities in Area A provided the reuse of the facility remains industrial (Ref. No. 13).

On 25 September 1991, NJDEP conducted an Site Inspection (SI) site reconnaissance of the Metz facility. NJDEP noted that the facility's hazardous waste storage area is located within a concrete lined and bermed area within Building C, and the flammable raw materials are stored in drums and small vessels outside of Building A on a concrete platform, without a secondary containment. However, any spills would either be contained in a concrete truck loading area, or enter the facility's storm drains and/or a retention basin. All above ground storage tanks were observed to have concrete or cinder block diking. NJDEP's final Site Inspection Report, dated 3 September 1991, recommended "no further action" (Ref. No. 4, pp. 30, 31, 652, 653).

In response to a letter from Metz claiming the precious metals recovery exemption from the Regulation of the Burning of Hazardous Waste in Boilers and Industrial Furnaces, an inspection was conducted by EPA on 16 April 1992 to determine if the facility was eligible. The inspector concluded that the requirements have been met and recommended no further enforcement action (Ref. No. 7, p. 2).

On 30 April 1992, Alliance Tech conducted a Hazardous Waste Inspection for NJDEP's Division of Hazardous Waste Management. The inspection revealed insufficient space between drums in the storage area, the facility may be exporting hazardous waste to Germany without proper notification and record keeping, and a wetland area maybe disrupted without the proper approval or permits (Ref. No. 7, p. 2).

The Region II Superfund Technical Assessment and Response Team (START) conducted an off-site reconnaissance at Metz on 21 May 1999. START observed that the facility is surrounded by a well-maintained 10 foot high chain-link fence topped with barbed wire. START also noted the presence of disconnected tanks located on concrete on the western side of Building A, and a tarp-covered soil pile located to the southwest of the facility. A playground was reported to be located adjacent to the southwest portion of the facility (Ref. No. 2, pp. 1-5).

The aquifer of concern provides drinking water to approximately 96,022 persons through public and private wells within a 4-mile radius of the site. The nearest well currently used for drinking purposes is a private well located within the 0 to 0.25-mile distance ring. The exact location is unknown. (Ref. Nos. 23; 25, pp. 16-17; 30). The nearest down slope surface water is a drainage ditch adjacent to the northwest corner of the site (Ref. Nos. 2, pp. 1, 5-6; 4, p. 653; 24). There are no drinking water intakes along the 15-mile surface water pathway (Ref. Nos. 24; 30). The Bound Brook, Green Brook, and Raritan River portions of the surface water pathway within the target distance limit support fisheries (Ref. Nos. 24; 36, pp. 2-11). There are approximately 18.2 miles of wetland frontage, and six sensitive environments along the 15-mile surface water pathway (Ref. Nos. 21; 22; 24; 28, p. 9; 36, pp. 5-11). There are no residences, schools or day care facilities located within 200 feet of the site (Ref. No. 2, pp. 1-6). There are 170,939 residents, 3,972.5 wetland acres, and seven sensitive environments within a 4-mile radius of the site (Ref. Nos. 21; 22; 23).

SITE ASSESSMENT REPORT: SITE INSPECTION

PART I: SITE INFORMATION

1. Site Name/Alias Metz Metallurgical Corp./Degussa Corp.
Street 3900 South Clinton Avenue
City South Plainfield State NJ Zip 07080
2. County Middlesex County Code 023 Cong. Dist. 06
3. CERCLIS ID NO. NJD002195303
4. Block No. 467.01 Lot No. 29.02
Block No. 470.01 Lot No. 1.02
5. Latitude 40° 33' 55.74" N Longitude 74° 25' 48.07" W
USGS Quad(s). Plainfield, NJ
6. Approximate size of site 11.9 acres
7. Owner (Lot No. 467.1) Metz Metallurgical Corp. Telephone No. (908) 561-1100
Street 3900 South Clinton Avenue
City South Plainfield State New Jersey Zip 07080
Owner (Lot No. 470.01) S. Sorce c/o Metz Metallurgical Corp. Telephone No. (908) 561-1100
Street 3900 South Clinton Avenue
City South Plainfield State New Jersey Zip 07080
8. Operator Degussa Corp., Metz Division Telephone No. (908) 561-1100
Street 3900 South Clinton Avenue
City South Plainfield State New Jersey Zip 07080

9. Type of Ownership

☒ Private ☐ Federal ☐ State
☐ County ☐ Municipal ☐ Unknown ☐ Other _____

10. Owner/Operator Notification on File

☒ RCRA 3001 15 August 1980 Date ☐ CERCLA 103c Date _____
☐ None ☐ Unknown

11. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments
Facility Wide Permit	NJ00010	8 June 1998	8 July 2003	Air Pollution Control, Surface Water Discharge, and Ground Water Discharge

Non-Domestic Wastewater
Discharge Permit 24055 1 October 1995 31 July 2000

12. Site Status

☒ Active ☐ Inactive ☐ Unknown

13. Years of Operation: 24 January 1978 to present

Ref. Nos. 1; 2, p. 3-4; 3; 4, pp. 7, 75, 655; 5; 8; 9, p. FAC1; 16

14. Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

a) Waste Sources

Waste Unit No.	Waste Source Type	Facility Name for Unit
1	<u>Contaminated Soil</u>	<u>ECRA Areas A through D</u>
2	<u>Aboveground Storage Tanks</u>	<u>Potassium Hydroxide Bulk Tank</u>
3	<u>Other</u>	<u>Vents and Pipes</u>

b) Other Areas of Concern

The facility currently maintains 36 stacks that vent to the atmosphere under Facility-Wide Permit No. NJ00010. Although, START did not observe any odors or visual emissions during the off-site reconnaissance conducted on 21 May 1999, the facility has been cited for unpermitted emissions in the past. An inspection was conducted by the Middlesex County Health Department on 26 December 1984, during which excessive black smoke emissions were observed. As a result, an NOV was issued on 24 January 1985. On 4 October 1985, the facility released approximately 2.04 pounds of nitrogen oxides (NOX) for 14 minutes. As a result of this NOX release, an Administrative Order (AO) and Notice of Civil Administrative Penalty Assessment was issued to Metz. On 22 and 26 September 1988, ammonium chloride was released from New Jersey Stack No. 054. On 30 October 1989, an unknown amount of NOX was released, but contained within the facility. An inspection was conducted at the site by the Middlesex County Health Department on 14 September 1990. As a result, Metz was issued an NOV citing the facility for failure to immediately notify NJDEP of a release of metal particulates resulting in a citizen complaint and posing a potential threat to public health and the environment. On 11 December 1990, approximately 15 pounds of silver powder/flake was released to the atmosphere when operating equipment failed. On 29 January 1991, an investigation was conducted by the Middlesex County Air Pollution Program at Metz. A NOV was issued to the facility charging Metz with allowing an acid-type odor to be transported beyond property lines resulting in a citizen complaint.

According to background information the facility has three capacitors that contain polychlorinated biphenyls. The capacitors range in volume from 10 to 35 gallons and are located within the confines of the site's buildings.

Ref. Nos. 2, pp. 1-4; 4, pp. 129, 393-394, 396-402; 9, pp. FAC-1,2-5; 10

15. Describe the regulatory history of the site, including the scope and objectives of any previous response actions, investigations and litigation by State, Local and Federal agencies (indicate type, affiliation, date of investigations).
 - On 12 June 1980, NJDEP conducted an inspection at Metz and observed an unpermitted discharge at the rear of the facility (Ref. No. 4, pp. 225, 226).
 - On 5 February 1982, a RCRA TSDF inspection was conducted by NJDEP at the Metz facility (Ref. No. 7, p. 1).
 - In July 1982, EPA reclassified Metz from a TSDF to a generator of hazardous waste (Ref. No. 4, pp. 216-220).
 - On 25 August 1982, approximately 1,000 gallons of 45% potassium hydroxide released from a fiberglass storage tank during filling operations. As a result of this incident, a NOV and Offer of Settlement was issued by NJDEP to Metz (Ref. No. 4, pp. 228-229, 420-422).

- On 26 and 27 April 1984, NJDEP performed a generator inspection at the Metz plant. During the inspection it was noted that the feed pipes for the cyanide destruct unit tank (T01) were disconnected and no longer in use (Ref. No. 4, pp. 180-181, 186, 216).
- An inspection was conducted by the Middlesex County Health Department on 26 December 1984, during which excessive black smoke emissions were observed. As a result, an NOV was issued on 24 January 1985 (Ref. No. 4, p. 393).
- On 10 August 1985, as a result of a fire, NJDEP was notified of a large, fuming hydrochloric acid tank (Ref. No. 4, pp. 416-417).
- As a result of a 4 October 1985 NOX release, an Administrative Order (AO) and Notice of Civil Administrative Penalty Assessment was issued to Metz. The facility was in violation by operating an overcharged vessel, running the reaction too rapidly, and operating the scrubber with a low liquor pH (Ref. No. 4, pp. 394, 401-402).
- Metz submitted the General Information Submission for the Environmental Cleanup Responsibility Act (ECRA) to the NJDEP on 3 February 1986 (Ref. No. 4, pp. 69-86). Subsequently, Metz submitted the second part of the ECRA application, which includes a sampling plan, to the NJDEP on 26 February 1986 (Ref. No. 4, pp. 88-169).
- On 24 and 25 June 1986, NJDEP performed a preliminary ECRA inspection under Case No. 86108 (Ref. No. 7).
- On 23 July 1986, Metz entered an Administrative Consent Order (ACO) with the NJDEP to carry out the ECRA investigation after the close of the sale of Metz to Degussa (Ref. No. 4, pp. 428-434).
- NJDEP conducted a RCRA generator inspection at the facility on 2 July 1987 (Ref. No. 7).
- A inspection of Stack No. 001 was conducted by NJDEP on 14 April 1989 (Ref. No. 4, pp. 388-391).
- On 15 September 1989, the NUS Corporation under EPA's Field Investigation Team (FIT) contract prepared a Potential Hazardous Waste Site Preliminary Assessment Report. The report recommends that the site be given a "high priority" (Ref. No. 4, pp. 188, 206-207).
- A Cleanup Plan for Metz Metallurgical Corp. was submitted to NJDEP on 31 July 1990. NJDEP subsequently approved the cleanup plan according to a 26 April 1991 NJDEP letter. In addition, NJDEP granted "no further action" for five ECRA areas of concern, including the historical drum storage area (Area B), the historical drum and equipment storage area (Area C), the equipment storage area (Area D), the former UST (Area F), and the soils in the vicinity of MW-105 (Area G), and for the excavated soil waste piles (Ref. No. 4, pp. 597-628, Ref. No. 12, pp. 1-2).

- An inspection was conducted at the site by the Middlesex County Health Department on 14 September 1990. As a result, Metz was issued an NOV (Ref. No. 4, p. 397).
- On 29 January 1991, an investigation was conducted by the Middlesex County Air Pollution Program at Metz. A NOV was issued to the facility and forwarded to NJDEP as a result of this investigation (Ref. No. 4, p. 400).
- A Discharge Surveillance Inspection was conducted on 27 March 1991 by the NJDEP. As a result of Metz's failure to renew its UST registration, a field NOV was issued (Ref. No. 4, pp. 19, 254-256, 436).
- On 29 May 1991, an interim inspection was performed of the on-going ECRA investigation by the NJDEP (Ref. No. 7).
- On 6 August 1991, NJDEP granted "no further action" for ECRA cleanup activities of Area A provided the facility remains industrial (Ref. No. 13).
- On 25 September 1991, NJDEP conducted an Site Inspection (SI) site reconnaissance of the Metz facility. The final Site Inspection Report, dated 3 September 1991, recommended "no further action" for the site (Ref. No. 4, pp. 30-31, 652-653).
- An inspection was conducted by the EPA on 16 April 1992 to determine if the facility was eligible for the precious metals recovery exemption from the Regulation of the Burning of Hazardous Waste in Boilers and Industrial Furnaces (Ref. No. 7).
- On 30 April 1992, Alliance Tech conducted a Hazardous Waste inspection for NJDEP's Division of Hazardous Waste Management (Ref. No. 7).
- In May 1992, the Final Report, addressing the environmental concerns of Areas A through G and AWT, and the north and south perimeters of the facility, prepared by CH2M Hill, was submitted to the NJDEP (Ref. Nos. 14, pp. 1, 8-9, 13; 15, pp. 2-4).
- NJDEP conducted a final ECRA inspection at Metz on 29 September 1992. NJDEP granted no further action to Metz for each area of concern and determined the cleanup was completed on 25 October 1992. The facility was released of its financial assurance requirements on 28 October 1992 (Ref. Nos. 7; 15, p. 1).
- On 27 April 1998, a RCRA Hazardous Waste Compliance Evaluation Inspection was performed at Metz by EPA. A Notice of Violation (NOV) was subsequently issued to Metz on 12 August 1998 (Ref. No. 7).
- The Region II START conducted an off-site reconnaissance at Metz on 21 May 1999 (Ref. No. 2, pp. 1-5).

- a) Is the site or any waste source subject to Petroleum Exclusion? Identify petroleum products and byproducts that justify this decision.

Based on available background information, Metz maintains an unknown number of oil expansions tanks located on the roof of the facility. These tanks contain Therminol 55, a non-polychlorinated biphenyl (PCB) containing heat transfer fluid. As a result of the ECRA investigation, extensive soil sampling was conducted in areas of concern (Areas A through G). As a result, petroleum hydrocarbons were identified in Areas A through F and AWT. The oil expansion tanks and petroleum contaminated soils will not be evaluated as a waste source for the purposes of this report since they are subject to the Petroleum Exclusion under CERCLA.

Ref. No. 4, pp. 248; 10; 12, pp. 1-2; 15, pp. 2-4

- b) Has normal farming application of pesticides registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) occurred at the site? Have pesticides been produced or stored at the site? Have there been any leaks or spills of pesticides on site?

Based on available background information, the site has not been used for agricultural purposes; therefore, normal farming application of pesticides registered under FIFRA has not occurred at the site. Pesticides have not been produced or stored on site, nor have there been any reported leaks or spills of pesticides.

Ref. Nos. 2; 4; 20

- c) Is the site or any waste source subject to RCRA Subtitle C (briefly explain)?

Based on a review of available background information, Metz filed a RCRA Notification of Hazardous Waste Activity form as a TSDF on 15 August 1980. According to a 5 December 1983 letter from Metz to NJDEP, the EPA reclassified the facility from a TSDF to a generator of hazardous waste in July 1982. Metz requested similar reclassification by NJDEP. On 13 April 1984, Metz was delisted as a TSDF and reclassified as a generator of hazardous waste and an existing IWMF by NJDEP.

Ref. Nos. 4, pp. 216-220, 222, 223; 8

- d) Is the site or any waste source maintained under the authority of the Nuclear Regulatory Commission (NRC)?

Based on available background information, neither the site nor any waste source are maintained under the authority of the NRC.

Ref. Nos. 4; 20

16. Do any conditions exist on site which would warrant immediate or emergency action?

During the off-site reconnaissance conducted by Region II START in May 1999, no conditions were noted that would warrant an immediate or emergency action.

Ref. No. 2

17. Information available from

Contact Cathy Moyik Agency U.S. EPA Telephone No.: (212) 637-4339
Preparer Kiersten Dorneman Agency Region II START Date: 31 December 1999

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 1 - ECRA Areas A-D

Source Type

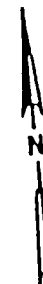
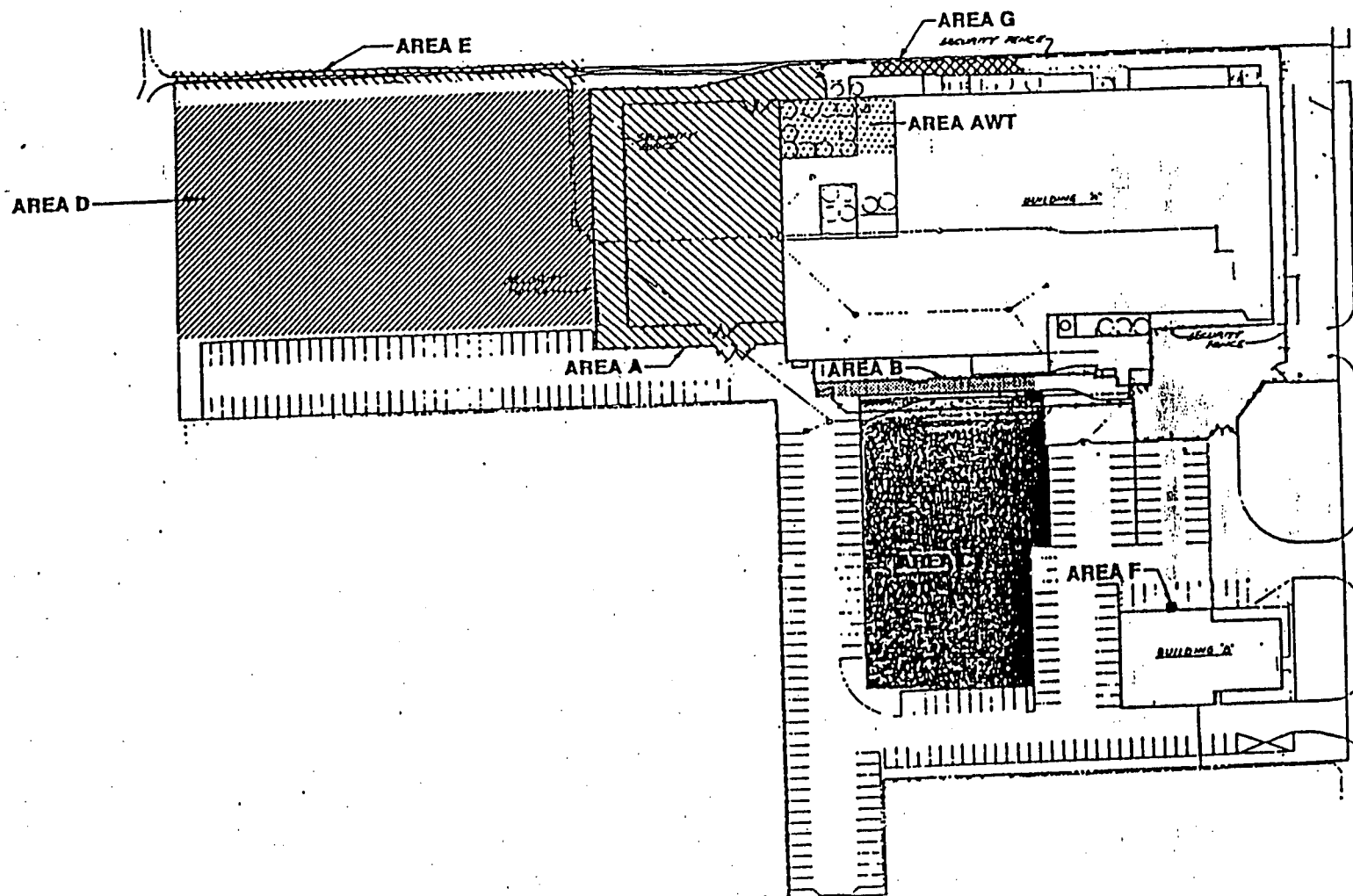
<u> </u>	Landfill	<u> X </u>	Contaminated Soil
<u> </u>	Surface Impoundment	<u> </u>	Pile
<u> </u>	Drums	<u> </u>	Land Treatment
<u> </u>	Tanks/Containers	<u> </u>	Other

Description:

During the ECRA investigation, four areas of concern containing contaminants attributable to site activities (Areas A through D) were identified and sampled. A map is presented in Figure 3. Area A is located adjacent to the western edge of Building A and is approximately 150 feet by 220 feet. Analytical results from soil samples A-1 through A-3, A-7, and A-10 collected on 27 April 1987, indicate the presence of arsenic, beryllium, silver, and cadmium at concentrations greater than the EPA's Generic Soil Screening Levels (SSLs). Additional samples were collected in April 1990 in Area A and analyzed at two depths (0.5 foot and 1.5 feet) to delineate the horizontal and vertical extent of contamination. None of the samples collected contained contaminants at concentrations greater than EPA's SSLs. In addition, two areas were excavated in April 1990. A 20 feet by 15 feet area was excavated to a depth of 1.5 feet around sample point A-10. Post-excavation samples were collected to confirm the horizontal and vertical extent of contamination had been removed. Analysis of these post-excavation samples for cadmium and silver indicated that the concentrations were below the SSLs. Sample location A-7 was covered by a concrete pad in 1988 and no longer accessible for excavation. Samples collected during the second round of sampling adjacent to sample location A-7 indicated that the extent of contamination was confined to beneath the concrete pad. During the May 1999 Region II START off-site reconnaissance, it was noted that the portion of the facility designated as Area A is currently covered by concrete.

Area B is a former drum storage area located south of Building A and is covered in asphalt. Analytical results from soil sample B-2 collected on 14 April 1987, indicate the presence of arsenic at a concentration greater than EPA's SSLs.

Area C was initially identified as a historical drum and equipment storage area located west of Building B. The area consists of approximately 0.8 acres of unpaved land surrounded by an asphalt paved parking lot. Analytical results from soil samples C-1 through C-5 collected on 1 April 1987, indicate the presence of arsenic at concentrations greater than EPA's SSLs. In



WESTON
MANAGERS DESIGNERS/CONSULTANTS

Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION

IN ASSOCIATION WITH RESOURCE APPLICATION, Inc.
C.C. JOHNSON & MALHOTRA, P.C., R.E. SARRIERA ASSOCIATES,
PRC ENVIRONMENTAL MANAGEMENT, AND GRB ENVIRONMENTAL SERVICES, INC.

EPA TM
C. Moyik

START PM
K. Dorneman

Figure 3
ECRA Areas of Concern

Metz Metallurgical Corp.

December 1989, the southern half of the area (approximately 140 feet by 122 feet) was paved. Prior to paving, a 0.5 foot of soil was excavated and stockpiled on the northern section of Area C. Additional samples were collected and analyzed for silver in April 1990 in Area C. None of the samples collected contained silver at concentrations greater than EPA's SSLs. During the May 1999 Region II START off-site reconnaissance, it was noted that the portion of the facility designated as Area C is currently covered in asphalt.

Area D is an open field, encompassing an area of approximately 200 feet by 330 feet, located west of Building A and Area A. Analytical results from samples collected on 2 April 1987 indicate the presence of arsenic at sample locations D-3 and D-6 at concentrations greater than EPA's SSLs. Additional samples were collected in March 1990 and analyzed for silver, cadmium, and copper. None were detected at concentrations greater than the SSLs.

Ref. Nos. 2, pp. 1, 4, 5; 4, pp. 470-481, 486, 487, 559-584; 12, p. 2; 17, pp. 6-26; 18, pp. 4-7

Hazardous Waste Quantity:

Area A

Based on analytical results from the April 1987 sampling event, there are five locations (A-1 through A-3, A-7, and A-10) where contaminants are detected at concentrations greater than EPA's SSLs. Sample locations A-1 through A-3 are unknown and sample locations A-7, and A-10 are separated from one another by samples that do not contain contaminants at concentrations greater than EPA's SSLs. Soil was excavated to 1.5 feet from the area surrounding sample location A-10; however, post-excavation samples were not analyzed for the contaminants arsenic and beryllium that were previously greater than EPA's SSLs. It is assumed that each location consists of 1 square foot (ft²) of contaminated soil. Therefore, the hazardous waste quantity is estimated to be 5 ft² of contaminated soil.

Area B

Based on analytical results from the 14 April 1987 sampling event, there is one location (B-2) where contaminants were detected at concentrations greater than EPA's SSLs. Assuming that the location consists of 1 ft², the hazardous waste quantity is estimated to be 1 ft² of contaminated soil.

Area C

Based on analytical results from the April 1987 sampling event, there are five locations (C-1 through C-5) where contaminants were detected at concentrations greater than EPA's SSLs. The area of contamination can be estimated by connecting sample points C-1 through C-5 on the sample location map. The hazardous waste quantity is estimated to be 24,500 ft² of contaminated soil.

Area D

Based on analytical results from the 2 April 1987 sampling event, there are two locations (D-3 and D-6) where contaminants were detected at concentrations greater than EPA's SSLs. The

sample locations are separated from one another by samples that have contaminant concentrations below EPA's SSLs. Assuming that each location consists of 1 ft², the hazardous waste quantity is estimated to be 2 ft² of contaminated soil.

Total Contaminated Soil

Area A + Area B + Area C + Area D = total area
 $5 \text{ ft}^2 + 1 \text{ ft}^2 + 24,500 \text{ ft}^2 + 2 \text{ ft}^2 = 24,508 \text{ ft}^2$

Ref. Nos. 4, pp. 470-481, 560-579; 18, pp. 4-7

Hazardous Substances/Physical State:

Analytical results of soil samples, A-1 through A-3, A-7, A-10, B-2, C-1 through C-5, D-3 and D-6, collected from different areas of concern on-site during the April 1987 sampling events indicate the presence of arsenic and beryllium and concentrations greater than EPA's SSLs. Arsenic was found in all samples at concentrations ranging from 0.64 to 2.70 mg/kg. Analytical results indicated the presence of beryllium in samples A-7 and A-10 at concentrations of 0.714 and 0.962 mg/kg, respectively. These metals have been deposited at the site as a solid.

Ref. Nos. 4, pp. 470-481; 18, pp. 4-7

PART II: WASTE SOURCE INFORMATION (continued)

For each of the waste units identified in Part I, complete the following items.

Waste Unit 2 - Potassium Hydroxide Bulk Tank

Source Type

<input type="checkbox"/> Landfill	<input type="checkbox"/> Contaminated Soil
<input type="checkbox"/> Surface Impoundment	<input type="checkbox"/> Pile
<input type="checkbox"/> Drums	<input type="checkbox"/> Land Treatment
<input checked="" type="checkbox"/> Tanks/Containers	<input type="checkbox"/> Other

Description:

On 25 August 1982, approximately 1,000 gallons of 45% potassium hydroxide released from a fiberglass storage tank during filling operations. The released substance reached the ground and a stream via storm drains. Potassium hydroxide was pumped back into the delivery truck and into the plant wastewater facility. The affected areas were flushed with water until neutral. The wash waters were treated at the facility's wastewater treatment facility. The aboveground storage tank has a maximum capacity of 6,000 gallons and is located adjacent to the south driveway. According to background information, a secondary containment berm has been constructed and a tertiary containment system has been implemented.

Ref. No. 4, pp. 129, 228, 229, 420-422

Hazardous Waste Quantity:

The hazardous waste quantity is estimated to be 1,000 gallons (gal).

Ref. No. 4, pp. 228, 420-422

Hazardous Substances/Physical State:

According to background information, the liquid consists of 45% potassium hydroxide. The waste is a liquid.

Ref. No. 4, pp. 228, 229, 420-422

PART II: WASTE SOURCE INFORMATION (continued)

For each of the waste units identified in Part I, complete the following items.

Waste Unit	<u>3</u>	-	<u>Vents and Pipes</u>
Source Type			
<u> </u>	Landfill	<u> </u>	Contaminated Soil
<u> </u>	Surface Impoundment	<u> </u>	Pile
<u> </u>	Drums	<u> </u>	Land Treatment
<u> </u>	Tanks/Containers	<u> X </u>	Other

Description:

Approximately 12 ounces (0.75 pounds) of silver chloride was discharged to the NJPDES permitted outfall (Permit No. NJ0034835) to the west of the facility on 14 February 1986. Silver nitrate had vented to the roof and combined with melting snow and excess salt to form silver chloride. The runoff from the roof entered the NJPDES outfall.

Approximately 300 pounds (lbs.) of silver nitrate liquid released onto the plant roof from a fractured pipe on 9 January 1989. According to facility personnel, approximately half of the spill was contained and recovered on the roof. The remaining material, approximately 150 pounds, reacted with the available chloride, forming insoluble silver chloride, and flowed down roof drains and into the NJPDES outfall. Temporary dams were constructed in the stream to contain the spill and plant processes were shut down to minimize the stream flow. The contaminated water was pumped to a tanker truck and transported back to the facility for silver recovery.

Less than 100 pounds of silver chloride was released from the facility to a drainage ditch receiving NJPDES discharge through the plant's non-contact cooling water on 13 September 1989. The plant was shut down to halt the flow of cooling water to the stream and two dams were installed, one on the Metz property, and a second in the receiving stream at the end of Century Avenue. The contaminated water contained by the temporary dams was discharged to the facility's wastewater treatment plant to recover the silver. As a result of this incident, 18 sediment samples were collected by CH2M Hill on 22 September 1989 and analyzed for silver to determine extent of contamination.

According to background information, the facility constructed a detention/retention basin to receive all non-contact cooling water and storm water run-off from the facility. The tertiary containment system is large enough to contain approximately 250,000 gallons of water.

Ref. No. 4, pp. 72, 133, 238-244, 250-252, 545-551, 578

Hazardous Waste Quantity:

The total weight of the silver chloride released is the sum of the three releases, approximately 250.75 lbs.

14 February 1986 release + 9 January 1989 release + 13 September 1989 release = total released
0.75 lbs. + 150 lbs. + 100 lbs. = 250.75 lbs.

Ref. Nos. 4, pp. 133, 238-244, 250-252, 545-551

Hazardous Substances/Physical State:

According to background information, material released consisted of silver chloride. Analysis of an aqueous sample collected from the 14 February 1986 release indicates the presence of silver chloride at 55.9 ppm. Sediment samples collected after the 9 January 1989 release detected silver at a maximum concentration of 10 mg/kg. An aqueous sample collected from the 13 September 1989 release contained 1.2 ppm of silver. The waste is a liquid.

Ref. No. 4, pp. 133, 238-244, 250-252, 545-551

PART III. SAMPLING RESULTS

EXISTING ANALYTICAL DATA

During 16 and 25 September 1985, seven monitoring wells (MW-101 through MW-107) were installed at the facility. Periodic water elevation measurements indicate that MW-104 and MW-105 are located upgradient of the site and its sources (Ref. No. 4, pp. 160, 162, 163, 453). On 19 and 20 November 1985, groundwater samples were collected from seven monitoring wells (MW-101 through MW-107) and an unspecified production well, and sampled for the 13 priority pollutant metals. According to background information, the samples were analyzed by Princeton Testing Laboratory, Princeton, New Jersey at an unknown quality assurance (QA) level. Antimony was detected in the groundwater at concentrations ranging from 0.21 to 1.42 milligrams per liter (mg/L) in monitoring wells MW-101, and MW-104 through MW-107. Analysis indicates that lead was found in concentrations ranging from 0.02 to 0.13 mg/L MW-101, and MW-104 through MW-106. Silver and copper were detected in MW-105 at 0.01 and 0.03 mg/L, respectively. Zinc was found at a concentration of 0.01 mg/L in wells MW-101, MW-102, MW-105, and MW-107. Analysis shows the presence of cadmium in MW-105 and MW-107 at concentrations 0.013 and 0.033 mg/L, respectively. None of the analytes detected were found at concentrations three times greater than those concentrations found in the upgradient, background wells (MW-104, and MW-105) (Ref. No. 4, pp. 165-167).

During 31 March and 2 April 1986, groundwater samples were collected from the seven on-site monitoring wells (MW-101 through MW-107) and an unspecified production well and were analyzed for priority pollutants, plus 40, by Princeton Testing Laboratory, Princeton, New Jersey at an unknown QA level. Analysis indicates that zinc was detected in samples from an unspecified production well, MW-102 through MW-107, and MW-109 (duplicate sample of MW-101) in concentrations ranging from 0.02 to 0.07 mg/L. Cyanide was found in an unspecified production well and MW-105 at concentrations of 0.015 and 0.01 mg/L, respectively. Carbon tetrachloride was reported in an unspecified production well, MW-102, and MW-104 through MW-106 at concentrations ranging from 10 to 34,000 micrograms per liter ($\mu\text{g/L}$). MW-101, MW-102, MW-104 through MW-106, and MW-109 contained concentrations of chloroform ranging from 2.6 to 580 $\mu\text{g/L}$. 1,1-Dichloroethane was found at concentrations ranging from 5.8 to 5,100 $\mu\text{g/L}$ in an unspecified production well, MW-102, and MW-104 through MW-106. Monitoring well samples MW-102, MW-104, and MW-105 contained 1,1,1-trichloroethane at concentrations ranging from 14 to 3,000 $\mu\text{g/L}$. Analysis showed trichloroethene in groundwater samples from an unspecified production well, MW-101, MW-104 through MW-106, and MW-109 at concentrations ranging from 4.6 to 410 $\mu\text{g/L}$. Trichlorofluoromethane was detected in groundwater samples MW-104 and MW-105 at concentrations of 7.2 and 590 $\mu\text{g/L}$, respectively. Tetrachloroethene, total xylenes, and bis(2-ethylhexyl) phthalate were reported in groundwater sample MW-105 at concentrations of 12, 160, and 250 $\mu\text{g/L}$, respectively. None of the analytes detected were identified at concentrations greater than three times the upgradient, background wells (MW-104, and MW-105) (Ref. No. 4, pp. 444, 456, 457).

A subsequent groundwater sampling event of monitoring well MW-105 and an unspecified production well was conducted on 12 May 1986. Two sets of duplicate samples and 1:1 diluted

samples were collected and analyzed for volatile organics by ETC, Edison, New Jersey and S.R. Analytical, Cherry Hill, New Jersey at an unknown QA level. The samples collected from MW-105 were also analyzed for base/neutral organics. Carbon tetrachloride, 1,1 dichloroethene, and 1,1,1-trichloroethane were detected in groundwater sample MW-105 by both labs at a maximum concentrations of 55,000, 12,200, and 3,590 µg/L, respectively. S.R. Analytical detected chloroform, methylene chloride, toluene, and trichloroethene in MW-105 at maximum concentrations of 270, 1,600, 260, and 250 µg/L, respectively. Trichlorofluoromethane was reported by ETC in groundwater sample MW-105 at concentrations less than 5,000 and 1,000 µg/L. Analytical results indicated that both labs detected carbon tetrachloride, methylene chloride, tetrachloroethene, and trichloroethene in an unspecified production well sample at maximum concentrations of 13.5, 17, 12.8, and 194 µg/L, respectively. S.R. Analytical detected bis(2-ethylhexyl) phthalate, and naphthalene at maximum concentrations of 1.3 and 3.3 µg/L, respectively, in groundwater sample MW-105. S.R. Analytical reported maximum concentrations of 1,1 dichloroethene at 1.8 µg/L, toluene at 3.5 µg/L, and 1,1,1-trichloroethane at 1.8 µg/L, in an unspecified production well, respectively. ETC detected trichlorofluoromethane in an unspecified production well sample at concentrations less than 10 µg/L. Di-n-butyl phthalate was reported at a maximum concentration of 12.3 µg/L in sample MW-105 by both labs. None of the organics detected in an unspecified production well were found at concentrations greater than three times the upgradient, background well (MW-105) (Ref. No. 4, pp. 447, 448, 450, 458-460).

In April 1987, soil and sediment samples were collected from seven areas of concern, identified as Areas A through G, and were analyzed by Garden State Laboratories, Irvington, New Jersey with analytical methodologies approved by the NJDEP. Areas A through D were analyzed for volatile organics, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and priority pollutant metals, Area E was analyzed for silver with one sample analyzed for priority pollutants plus 40, Area F was analyzed for petroleum hydrocarbons with one sample analyzed for base/neutral organics plus 15, and Area G was analyzed for volatile organics (Ref. No. 11, pp. 1-3, 5-24).

On 1 April 1987, five soil samples (C-1 through C-5) were collected from Area C. Analytical results indicate the presence of nickel, silver, zinc, cadmium, copper, thallium, and arsenic in all five soil samples at concentrations ranging from 32.6 to 44.8, 4.86 to 7.41, 75.5 to 106, 0.44 to 0.98, 32.4 to 85.1, 5.68 to 6.94, and 1.18 to 2.70 mg/kg, respectively. Chromium, lead and petroleum hydrocarbons were also detected in all five samples at concentrations ranging from 18.4 to 27.7, 43.0 to 54.0, and less than 20 to 161 mg/kg, respectively. Mercury was reported in soil samples C-1 and C-4 at 0.069, and 0.072 mg/kg. Sample C-1 contained selenium at a concentration of 0.117 mg/kg. Arsenic was found in all five soils samples at concentrations greater than EPA's SSLs (Ref. Nos. 11, pp. 13-14; 18).

Six soil samples (D-1 through D-6) were collected from Area D on 2 April 1987. Analytical results indicate the presence of nickel, silver, zinc, cadmium, copper, and thallium in all six soil samples at concentrations ranging from 31.0 to 38.9, 5.62 to 63.0, 73 to 114, 0.97 to 13.0, 39.2 to 336, and 5.36 to 6.74 mg/kg, respectively. Arsenic, chromium, lead, and mercury were detected in soil samples D-3 and D-6 at concentrations of 1.28 and 2.35, 22.4 and 25.8, 36.3 and 51.4, and 0.368 and 0.469 mg/kg, respectively. Petroleum hydrocarbons were reported in soil samples D-1, D-2, and D-4

through D-6 at concentrations ranging from 54.2 to 323 mg/kg. Arsenic was detected in soil samples D-3 and D-6 at concentrations greater than EPA's SSLs (Ref. Nos. 11, pp. 15-16; 18).

On 14 April 1987, three subsurface soil samples (B-1 through B-2) were collected from Area B. Analytical results indicate the presence of nickel, silver, zinc, copper, and thallium in all three subsurface soil samples at concentrations ranging from 33.1 to 36.2, 1.53 to 4.91, 58.4 to 95.0, 9.82 to 87.3, and 3.94 to 7.04 mg/kg, respectively. Cadmium was detected in subsurface soil samples B-2 and B-3 at concentrations of 1.24, and 1.51 mg/kg, respectively. Sample B-2 contained concentrations of arsenic, chromium, and lead at concentrations of 0.89, 14.1, and 17.0 mg/kg. Petroleum hydrocarbons were found in soil sample B-3 at a concentration of 169 mg/kg. Toluene, ethyl benzene, and xylene were reported in soil sample B-1 at levels of 0.029, 0.017, and 0.068 mg/kg. Arsenic was detected in soil sample B-2 at concentrations greater than EPA's SSLs (Ref. No. 11, pp. 10-12; 18).

On 14 and 15 April 1987, five subsurface soil samples (F-1 through F-5) were collected from Area F at 6 to 6.5 feet below the surface. Petroleum hydrocarbons were detected in soil samples F-1, F-2, and F-5 at concentrations ranging from 46.6 to 2,406 mg/kg (Ref. No. 11, pp. 21, 22).

On 15 April 1987 seven subsurface soil samples were collected from Area G. No volatile organic compounds were detected (Ref. No. 11, pp. 23, 24).

On 23 April 1987, forty-four sediment samples were collected from a length of a drainage channel on the north boundary of Area D and analyzed for silver content. The samples were collected at set distances from the spill discharge point along the north and south shores, the centerline and vertical (subsurface). The silver concentrations are reported in the following table.

Area E- Summary of Analytical Results (Silver - mg/kg)

Location	North (0-0.1 ft)	Center (0-0.1 ft)	Vertical (0.5-1 ft)	South (0-0.1 ft)
0-50		1019		
0+00		9458		
0+10	282			
0+20		584		
0+40	1272	32.5	2.97	265
0+60		268		
0+80	364	2053		19.9
0+110		2730		
0+160	490	157	2.67	24.3
0+220	2071	1648		187
0+300	286	2304	5.48	30.7

In addition, one sediment sample (0+35 CL) was analyzed for priority pollutants plus 40. Analytical results indicate the presence of the following analytes at the following concentrations: nickel at 31.9 mg/kg, silver at 99.5 mg/kg, zinc at 141 mg/kg, cadmium at 1.42 mg/kg, copper at 870 mg/kg, thallium at 1.96 mg/kg, arsenic at 2.05 mg/kg, beryllium at 0.750 mg/kg, chromium at 12.3 mg/kg, lead at 30.9 mg/kg, mercury at 0.262 mg/kg, cyanide at 0.269 mg/kg, and phenol at 2.50 mg/kg. (Ref. Nos. 11, pp. 17-20).

Eleven soil samples (A-1 through A-11) were collected from Area A on 27 April 1987. Analytical results indicate the presence of nickel, silver, zinc, copper, and thallium in all eleven samples at concentrations ranging from 24.2 to 160, 1.29 to 674, 87.6 to 237, 84 to 500, and 4.02 to 10.7 milligrams per kilograms (mg/kg), respectively. Samples A-1 through A-4, and A-6 through A-11 contained cadmium at concentrations ranging from 1.89 to 178 mg/kg. Arsenic, chromium, and lead were detected in soil samples A-1 through A-3, A-7, and A-10 at levels ranging from 0.64 to 1.82, 16.8 to 141, and 17.6 to 87.6 mg/kg, respectively. Samples A-7 and A-10 contained beryllium at concentrations of 0.714 and 0.962 mg/kg, respectively. Mercury was found in soil samples A-1 through A-3 at concentrations ranging from 0.056 to 0.096 mg/kg. Petroleum hydrocarbons were detected in samples A-1 through A-3, A-6, A-8, and A-10 at concentrations ranging from 49.4 to 1,852 mg/kg. Analysis indicates the presence of chlorobenzene, xylene, and trichloroethylene at concentrations of 0.07, 0.026, and 0.076 mg/kg, respectively, in soil samples A-1, A-3, and A-4, respectively. Three sidewall soil samples (AXSW-1 through AXSW-3) from a construction excavation in Area A were collected on 14 April 1987. Petroleum hydrocarbons were reported in all samples collected at a depth of 0 to 0.5 feet at concentrations ranging from 404 to 421 mg/kg, and at concentrations ranging from 71.1 to 315 mg/kg at a depth of 1.5 to 2 feet. Cadmium was found at concentrations ranging from 4.03 to 7.15, and 5.58 to 8.68 mg/kg at depths of 0 to 0.5, and 1.5 to 2 feet, respectively. Thallium was detected at concentrations ranging from 6.24 to 7.38, and 4.45 to 6.56 mg/kg at depths 0 to 0.5, and 1.5 to 2 feet, respectively. Silver was found at concentrations greater than the EPA's soil screening levels (SSLs) in A-7. Cadmium was detected at levels greater than the EPA's SSLs. Samples A-1 through A-3, A-7, and A-10 contained concentrations of arsenic greater than the EPA's SSLs. Beryllium was also found at concentrations greater than the SSLs in soil samples A-7 and A-10 (Ref. Nos. 11, pp. 5-9; 18).

On 16, 17, and 23 September 1987, a supplemental soil sampling event was conducted in Area D. Ten soil samples (D-7 through D-17) were collected in Area D from eleven test pits. Sidewall samples were collected from a depth of 1 foot to bedrock at 1 foot intervals. Samples were analyzed for metals, specifically silver, cadmium, and copper, by CFM Environmental Services, Inc., Whippany, New Jersey at an unknown QA level. Samples from test pits D-7, D-9 and D-10 were analyzed for petroleum hydrocarbons by Intech Biolabs, New Jersey at an unknown QA level. The results are reported in the following table:

Area D - Summary of Analytical Results, Supplemental (mg/kg)

Test Pit	Depth (ft)	Silver	Cadmium	Copper	Petroleum Hydrocarbons
D-7	1.0	79.95	2.33	37.16	265
	2.0	0.57	0.23	4.65	
	3.0	0.08	0.04		
	4.0	0.19			23
D-8	1.0	0.15	0.79	12.76	
	2.0	0.15	0.33	8.44	
	3.0	0.14	0.98	21.25	
	4.0	0.01	0.04		
D-9	1.0	0.23	0.23	5.20	16
	2.0	0.04	0.04	5.21	
	3.0	0.33	0.20	27.82	60
	4.0	0.22	0.12		
	5.0	0.19	0.10		
	6.0	0.34			18
D-10	1.0	49.92	3.37	112.96	110
	2.0	0.43	0.50	16.41	
	3.0	0.48	0.24	18.35	18
	4.5	0.13	0.06		
D-11	1.0	0.03	0.31	5.19	
	2.0	0.20	0.32	24.62	
	3.0	0.13	0.12		
D-12	1.0	0.12	0.10	4.80	
	2.0	0.10	0.06		
D-13	1.0	0.28	0.45	12.43	
	2.0	0.46	0.41	11.72	
	3.0	0.10	0.10	6.90	
	4.0	0.10	0.03		
	5.0	0.12			

Test Pit	Depth (ft)	Silver	Cadmium	Copper	Petroleum Hydrocarbons
	6.0	0.18			
D-14	1.0	0.07	0.03	11.82	
	2.0	0.17	0.12	5.02	
	3.0	0.19			
D-15	2.0	0.25	0.36	409.52	
	3.0	0.13	0.08	8.74	
	4.0	0.09	0.03	5.58	
D-16	1.0	1.00	3.16	42.22	
	2.0	0.25	1.21	32.12	
	3.0	0.20	1.24	43.33	
	4.0	0.06	0.38		
	5.0	0.08			
	6.0	0.20			
D-17	1.0	4.23	1.34	38.67	
	2.0	0.22	1.20	14.24	
	3.0	0.14	0.09		

None of the samples collected contained concentrations of analytes above those in the EPA's SSLs (Ref. Nos. 4, pp. 510, 511, 517, 542A; 18).

Between 1 and 8 February 1988, groundwater samples were collected from the seven on-site monitoring wells and from the two production wells (MW 101 through MW 107, PW 1, and PW 2) and analyzed for priority pollutant metals at an unknown QA level by CFM Environmental Services, Inc., Whippany, New Jersey. Analytical results indicate the presence of arsenic at a concentration of 0.2 µg/L in sample PW 2 and MW 102. MW 103 and MW 104 contained arsenic at a concentration of 0.3 µg/L. Cadmium was reported at a concentration of 15 µg/L in MW 105. Groundwater samples MW 103 and MW 105 contained chromium at concentrations of 2.5 and 20 µg/L, respectively. Copper was found in samples MW 105 and Field Blank C at levels of 25 and 15 µg/L, respectively. Samples MW 101 through MW 106, PW 1, Field Blanks B and C, and the Trip Blank contained lead in concentrations ranging from 50 to 75 µg/L. Mercury was detected in MW 107, PW 2, and Field Blank A at concentrations ranging from 0.15 to 0.25 µg/L. Nickel was reported in samples MW 103 and MW 106 at a concentration of 4.0 µg/L, and in sample MW 105 at a concentration of 6.0 µg/L. Silver was identified in groundwater sample MW 105 at a concentration of 20 µg/L. Groundwater samples MW 103, MW 105, and MW 106 contained thallium at concentrations ranging from 4.0 to 6.0 µg/L. Zinc was found in all groundwater samples, the three field blank samples, and the one trip blank sample at concentrations ranging from 10.0 to

28.0 µg/L. None of the metals detected in the downgradient samples (MW 101 through MW 103, MW 106, MW 107, PW 1, and PW 2) were found at concentrations greater than three times the upgradient, background wells (MW 104 and MW 105) (Ref. No. 4, pp. 524A, 527-539).

On 17 February 1988, subsurface soil samples (AWT-1 through AWT-6) were collected at one foot intervals from a section of Area A planned for a water treatment plant. The samples were analyzed for silver, cadmium, copper, and petroleum hydrocarbons by an unknown lab at an unknown QA level. The results are presented in the following table:

Area AWT - Summary of Analytical Results, Supplemental (mg/kg)

Test Pit	Depth (ft)	Silver	Cadmium	Copper	Petroleum Hydrocarbons
AWT-1	1.0	0.11	0.04	2.36	65.11
	2.0	0.03	0.01	0.38	48.05
AWT-2	1.0	0.24	0.11	10.18	79.72
	2.0	0.43	0.25	21.45	121.96
	2.5				79.31
AWT-3	1.0	0.33	0.27	20.81	214.21
	2.0	0.19	0.79	2.56	88.35
	2.5				74.33
	3.0				53.77
AWT-4	1.0	0.35	3.19	32.45	95.61
	1.5		0.15		
	2.0	0.09	0.03	1.18	48.52
AWT-5	1.0	0.37	0.15	20.59	76.87
	2.0	0.27	0.13	15.51	86.87
AWT-6	1.0	0.33	2.25	28.07	2552.34
	2.0	0.25	2.01	39.08	981.49
	3.0				358.56
	3.5				107.85

None of the samples collected contained concentrations of analytes above those in the EPA's SSLs (Ref. Nos. 4, 512-514, 519; 18).

On 23 May 1988, subsurface soil samples were collected at three locations (A-8, B-3, and F-3). The samples were analyzed for petroleum hydrocarbons at an unknown QA level by Accredited Laboratories, Inc., Carteret, New Jersey. No petroleum hydrocarbons were detected at location A-8 at depths of 1.5 and 2.0 feet. Analytical results indicate the presence of petroleum hydrocarbons at location B-3 at sample depths of 2.0 and 2.5 feet at concentrations of 726, and 279 mg/kg, respectively. Samples collected at depths of 7.0, 7.5, 8.0, and 8.5 feet from soil sample location F-3 contained concentrations of petroleum hydrocarbons ranging from 137 to 3,710 mg/kg (Ref. No. 4, pp. 514, 515, 520, 541, 542).

In March 1989, six surface soil samples (PS-1 through PS-6) were collected from the southern and western perimeter of the facility by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. The six samples were analyzed for silver, while samples PS-3 through PS-6 were also analyzed for petroleum hydrocarbons, cadmium, and copper. Analytical results indicated the presence of petroleum hydrocarbons in soil sample PS-3 at a concentration of 76 mg/kg. Silver was detected in all six soil samples at concentrations ranging from 3.3 to 52 mg/kg. Cadmium and copper were reported in soil samples PS-3 through PS-6 at concentrations ranging from 1.1 to 3.3, and 57 to 83 mg/kg. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. Nos. 4, pp. 559, 585, 587-589; 18).

On 22 September 1989, eighteen sediment samples (SS-1 through SS-18) were collected from the centerline of the stream bed of the drainage ditch receiving the NJPDES outflow. The samples were analyzed for silver by CFM Environmental Services, Inc., Whippany, New Jersey at NJDEP Tier II QA level. Distances are measured downstream of Point D, located at the northwest corner of the facility. Silver concentrations ranged from 0.28 to 3.89 mg/kg. The maximum concentration was located 575 feet downstream of Point D (SS-4) (Ref. No. 4, pp. 546, 548-551).

In November 1989, soil samples were collected from Area C and analyzed by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. Samples C-4, C-4-a through C-4-c were analyzed for petroleum hydrocarbons at two depths, surface and 0.5 foot. In addition, surface soil sample C-4 was analyzed for base/neutral organics, plus 15. Soil samples C-2, C-3, and C-5, collected at a depth of 0.5 foot, and C-6 through C-9, collected at surface and 0.5 foot, were analyzed for silver. Petroleum hydrocarbons were detected at concentrations ranging from 83 to 250 mg/kg. The total concentration of targeted base/neutral organic compounds detected was 3.5 mg/kg. Analytical results indicate the presence of silver in surface samples C-6 through C-9 at concentrations ranging from 5.9 to 58.0 mg/kg. Samples C-3, and C-7 through C-9, collected at 0.5 foot, contained concentrations of silver ranging from 3.0 to 23.0 mg/kg. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. No. 4, pp. 557, 559, 570, 573-575; 18).

In March 1990, surface soil samples were collected from fourteen locations (D-1-a through D-1-c, D-2-a through D-2-c, D-3-a, D-4-a through D-4-c, D-6-a, and D-PS-1 through D-PS-3) within and along the perimeter of Area D, and subsurface soil samples (1.5 feet) were also collected from seven of these locations (D-1-b, D-2-a, D-2-c, D-3-a, D-4-b, D-PS-1, and D-PS-3). The samples were analyzed for petroleum hydrocarbons, silver, cadmium, and copper by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, two soil samples (D-2-a (1.5 feet), and D-PS-2) were analyzed for base/neutral organics, plus 15. One surface soil sample (TS-1) was collected from

a Therminol-55 spill point and analyzed for petroleum hydrocarbons, base/neutral organics, plus 15, and PCBs. Petroleum hydrocarbons were reported at subsurface (1.5 feet) sample locations D-1-b, D-2-a, D-2-c, D-3-a, D-4-b, D-PS-1, and D-PS-3 at concentrations ranging from 52 to 200 mg/kg. Surface soil samples D-1-c, D-2-a, D-2-b, D-2-c, D-3-a, D-4-a, D-4-b, D-4-c, D-6-a, D-PS-1, D-PS-2, and D-PS-3 contained petroleum hydrocarbons at concentrations ranging from 42 to 230 mg/kg. Analytical results indicate the presence of silver and cadmium at surface sample locations D-3-a, D-6-a, D-PS-1, D-PS-2, and D-PS-3 at concentrations ranging from 38 to 130, and 1.7 to 8.8 mg/kg, respectively. Subsurface soil samples D-3-a, D-PS-1, and D-PS-3 collected at 1.5 feet contained silver and cadmium at concentrations ranging from 15 to 150, and 1.1 to 14 mg/kg, respectively. Copper was detected at concentrations ranging from 100 to 200 mg/kg at surface soil sample locations D-6-a, and D-PS-1 through D-PS-3. Subsurface (1.5 feet) soil samples D-PS-1, and D-PS-3 contained 230, and 42 mg/kg of copper, respectively. The total concentrations of targeted base/neutral organic compounds detected at sample locations D-2-a, and D-PS-2 were 4.18, and 0.33 mg/kg, respectively. Soil sample TS-1 contained petroleum hydrocarbons at a concentration of 26 mg/kg. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. Nos. 4, pp. 559, 574, 576-579; 18).

In April 1990, 30 soil samples were collected from Area A and analyzed for silver, cadmium, copper, chromium, nickel, and petroleum hydrocarbons by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, two surface soil samples (A-10-a, and A-10-b) were analyzed for base/neutral organics, plus 15. Soil samples A-10-c, A-12 through A-20 were collected at two depths of 0.5, and 1.5 feet, and A-7-a, A-7-b, A-10-a, A-10-b, and A-10-d were collected at the surface, and at 1.5 feet. Eight additional soil samples were collected from four locations at two depths (0.5, and 1.5 feet), half from former drum storage areas (A-DS-1 and A-DS-2) and half from the location of a corrosive spill (A-CS-1 and A-CS-2), and were analyzed for priority pollutants plus 40, palladium, and petroleum hydrocarbons. Petroleum hydrocarbons were detected at concentrations ranging from 88 to 180 mg/kg in surface soil sample locations A-7-a, A-7-b, A-10-a, and A-10-b. Petroleum hydrocarbons were also reported in subsurface (0.5 foot) soil samples A-10-c, A-12, A-13, A-16 through A-18, A-20, and A-CS-1 at concentrations ranging from 26 to 650 mg/kg, and in subsurface (1.5 feet) soil samples A-7-b, A-10-a, A-10-b, A-10-c, A-12, A-18, A-20, A-DS-1, A-CS-1, and A-CS-2 at concentrations ranging from 28 to 86 mg/kg. Analytical results indicated the presence of silver, cadmium, copper, chromium, and nickel at all surface sample locations at concentrations ranging from 4.5 to 95, 2.6 to 21, 9.3 to 170, 7.7 to 17, and 4.1 to 34 mg/kg, respectively. Silver and cadmium were found in subsurface (0.5 foot) soil samples A-10-c, A-12 through A-14, A-17, A-18, and A-20 at concentrations ranging from 5.8 to 120, and 1.2 to 63 mg/kg, respectively, and in subsurface (1.5 feet) soil samples A-7-b, A-10-a, A-10-b, A-10-c, A-12, and A-20 at concentrations ranging from 3.8 to 26, and 1.8 to 6.8 mg/kg, respectively. Silver was reported in sample A-16 (1.5 feet) at 11 mg/kg. Subsurface soil samples A-10-d (1.5), A-16 (0.5), A-17 (1.5), and A-18 (1.5) contained cadmium at concentrations of 1.8, 1.6, 7.3, and 1.7 mg/kg, respectively. Analytical results indicated the presence of copper, chromium, and nickel in subsurface (0.5 foot) soil samples A-10-c, A-12 through A-20 at concentrations ranging from 7.4 to 170, 7.2 to 31, and 8 to 35 mg/kg, respectively, and in subsurface (1.5 feet) soil samples A-7-a, A-7-b, A-10-a, through A-10-d, A-12, and A-14 through A-20 at concentrations ranging from 3.8 to 320, 5.2 to 25, and 4.6 to 38 mg/kg, respectively. Copper and chromium were reported at concentrations of 3.8, and 5.2 mg/kg, respectively, in subsurface soil sample A-13 (1.5). The total concentrations of targeted

base/neutral organic compounds detected in surface soil samples A-10-b, A-DS-1, A-DS-2, A-CS-1, and A-CS-2 were 2.8, 0.15, 0.2, 0.12, 0.61 mg/kg, respectively. Silver was reported in A-CS-1 and A-CS-2 at a concentration of 5.2 mg/kg. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. Nos. 4, pp. 559, 560, 562-568; 18).

In April 1990, subsurface soil samples (B-3-b through B-3-d) were collected from Area B at a depth of 2.0 to 2.5 feet and analyzed for petroleum hydrocarbons by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, one soil sample was analyzed for base/neutral organics, plus 15. Petroleum hydrocarbons were detected in soil sample B-3-d at a concentration of 100 mg/kg (Ref. No. 4, pp. 559, 568, 570-572).

Eight post-excavation soil samples (F-1-a through F-8-a) were collected in April 1990 from Area F and analyzed for petroleum hydrocarbons by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, two samples (F-4-a, and F-7-a) were analyzed for base/neutral organics, plus 15, and one sample (F-4-a) was analyzed for volatile organic analytes, plus 15, priority pollutant metals, and PCBs. Analytical results indicated the presence of petroleum hydrocarbons in subsurface samples F-1-a (3.5 feet), F-3-a (7.5 feet), F-4-a (7.5 feet), and F-7-a (7.5 feet) at concentrations ranging from 31 to 1,500 mg/kg. Total base/neutral organics were detected in sample F-4-a at a concentration of 4.27 mg/kg (Ref. No. 4, pp. 559, 561, 580-584).

In April 1990, three subsurface soil samples (G-a through G-c) were collected at a depth of 3.5 feet from Area G and analyzed for volatile organics, plus 15, by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. No volatile organic compounds were detected (Ref. No. 4, pp. 559, 584-586).

In April 1990, ten soil samples (C-SP-1 through C-SP-10) were collected from soil that had been excavated from sample location C-4 and stockpiled from Area C. The samples were analyzed for petroleum hydrocarbons and silver by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, two samples (C-SP-3, and C-SP-5) were analyzed for base/neutral organics, plus 15. Petroleum hydrocarbons and silver were reported in all ten samples at concentrations ranging from 33 to 170, and 7.9 to 41.0 mg/kg, respectively. Total base/neutral organics were detected in samples C-SP-3, and C-SP-5 at concentrations of 2.05, and 1.32 mg/kg, respectively. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. Nos. 4, pp. 559, 589-591; 18).

In April 1990, ten samples (AWT-SP-1 through AWT-SP-10) were collected from the soil that had been excavated from Area A and stockpiled in Area D. The samples were analyzed for petroleum hydrocarbons, silver, and cadmium by Accutest Laboratories, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, two samples (AWT-SP-4, and AWT-SP-6) were analyzed for base/neutral organics, plus 15. Petroleum hydrocarbons, silver, and cadmium were detected in all ten samples at concentrations ranging from 46 to 420, 68 to 110, and 3.3 to 6.8 mg/kg, respectively. Total base/neutral organics were detected in samples AWT-SP-4, and AWT-SP-6 at concentrations of 6.69, and 35.18 mg/kg, respectively. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. Nos. 4, pp. 559, 590, 592-593; 18).

Thirty-one post-excavation sediment samples were collected at 30 foot intervals from Area E in a zig-zag pattern after the excavation events conducted between 27 November and 4 December 1990 and between 17 June and 2 July 1991. Samples were analyzed for silver by Accutest Laboratory, Dayton, New Jersey at NJDEP Tier II QA levels. In addition, three samples (EX-1 through EX-3) were collected from the centerline of the on-site portion of Area E and analyzed for petroleum hydrocarbons and volatile organics. After remedial actions were completed, silver was detected at location 150 feet, collected from the right bank, at a concentration of 4.1 mg/kg, and at location 570 feet, collected from the right bank, at a concentration of 24 mg/kg. Subsequent remedial action and sampling were conducted at station 570 on 22 July 1991. After the 22 July 1991 remediation, silver was not detected at station 570. Methylene chloride, a common lab contaminant, was reported in sediment samples EX-2 and EX-3 at concentrations of 10 and 7 µg/kg, respectively. None of the analytes detected were found at concentrations greater than EPA's SSLs (Ref. Nos. 18; 19, pp. 3-8).

On 22 and 24 May 1991, post-excavation samples were collected from perimeter sample locations PS-1, PS-2, and PS-3 and were analyzed for silver and cadmium by Accutest Laboratory, Dayton, New Jersey at NJDEP Tier II QA levels. Silver was reported in samples collected from perimeter location, PS-2 in concentrations ranging from 4.3 to 27 mg/kg, at depths ranging from 0 to 2.5 feet. After a subsequent removal event, post-excavation samples were recollected from perimeter sample location PS-2 on 24 June 1991. Silver was not detected in the samples collected from sample location PS-2 after the remediation was completed (Ref. No. 19, pp. 9-11).

SITE INSPECTION PRIORITIZATION SAMPLING RESULTS

Based on a review of available background information, data, and target information applicable to evaluating the site under the Hazard Ranking System (HRS), it was determined that further sampling was not necessary to characterize the site.

PART IV. HAZARD ASSESSMENT

GROUNDWATER ROUTE

- 1. Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence and relationship to background.**

A release of contaminants to groundwater is not observed or suspected. A review of the analytical results from the on-site monitoring and production wells suggests that a release of contaminants attributable to the site has not occurred. Analyses from monitoring and production well samples collected on 20 November 1985, 31 March through 2 April 1986, 12 May 1986, and 1 through 8 February 1988 were below the MCL established under EPA's National Primary and Secondary Drinking Water Regulations, with the exception of cadmium and several organic contaminants. However, cadmium and the organic contaminants are not observed in the downgradient wells (MW-101 through 103, MW-106, MW 107 and production) at concentrations greater than three times the concentrations found in the upgradient background wells (MW-104 and MW-105). NJDEP granted Metz no further action for the ECRA groundwater investigation on 26 April 1991, concluding that the volatile organic groundwater data indicates an off-site, upgradient source.

Ref. Nos. 4, pp. 163-164, 167, 451-461, 524A-539; 12, pp. 1, 4

- 2. Describe the aquifer of concern; include information such as depth, thickness, geologic composition, areas of karst terrain, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

The aquifer of concern is the Passaic Formation, or Brunswick Formation, which consists of systematically-fractured, non-marine, reddish-brown mudstone, shale siltstone, and sandstone. Occurring at less than five feet below ground surface, the Passaic Formation has a maximum thickness of 10,000 feet. However, the water yielding portion of the formation has an approximate thickness of 600 feet. The aquifer of concern has a permeability of 1×10^{-6} centimeters per second (cm/s). The Passaic Formation is overlain by approximately five feet of Klinesville Loam, which consists of reddish, moderately coarse textured soils, containing much soft shale fragments especially in the lower part of the profile. The depth to the water table is approximately 25 feet below ground surface. Based on water elevations found in on-site monitoring wells, the groundwater beneath the site flows southeast.

Ref. Nos. 4, pp. 158-159, 162-163, 453; 27, pp. 1-2; 28, p. 4; 29, pp. 1-3

3. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

The depth of the lowest point of waste disposal/storage is 2.0 feet. Soil sample D-3 was collected on 2 April 1987 at a depth ranging from 1.5 to 2.0 feet below ground surface. The highest seasonal level of the saturated zone of the aquifer of concern is approximately 25 feet below ground surface. Therefore, the depth from the lowest point of waste disposal/storage to the highest seasonal level of the aquifer of concern is estimated to be 23 feet.

Ref. Nos. 4, p. 162, 481; 18

4. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the top of the aquifer of concern?**

The least permeable intervening stratum between the ground surface and the top of the aquifer of concern is approximately 20 feet of the Passaic Formation, which has an approximate permeability of 1×10^{-6} cm/s.

Ref. No. 4, p. 159; 28; 29, pp. 1-3

5. **What is the net precipitation at the site (inches)?**

The net precipitation at the site is greater than 15 to 30 inches.

Ref. No. 28, pp. 2-3

6. **What is the distance to and depth of the nearest well that is currently used for drinking purposes?**

The nearest well currently used for drinking is a private well located within the 0 to 0.25 mile distance ring from the site. The exact location and depth of the well are unknown.

Ref. Nos. 23; 25, pp. 16-17; 30

7. **If a release to groundwater is observed or suspected, determine the number of people that obtain drinking water from wells that are documented or suspected to be actually contaminated by hazardous substance(s) attributed to an observed release from the site.**

A release to groundwater is not observed or suspected. Refer to Question 1 for a description of the likelihood of release to groundwater.

Ref. Nos. 4, pp. 163-164, 167, 451-461, 524A-539; 12, pp. 1, 4

8. Identify the population served by wells located within 4 miles of the site that draw from the aquifer of concern.

<u>Distance</u>	<u>Population</u>		
	<u>Public Wells</u>	<u>Private Wells</u>	<u>Total Population</u>
0 - ¼ mile	0	47	47
>¼ - ½ mile	0	135	135
>½ - 1 mile	0	358	358
>1 - 2 miles	6,360	1,576	7,936
>2 - 3 miles	43,532	2,051	45,583
>3 - 4 miles	39,842	2,121	41,963

A total of 96,022 persons obtain drinking water from the aquifer of concern within a 4-mile radius of the site.

Ref. Nos.23; 25, pp. 16-17; 30

State whether groundwater is blended with surface water, groundwater, or both before distribution.

The groundwater is blended with groundwater prior to distribution by the Middlesex Water Company. The groundwater is blended with both surface water and groundwater prior to distribution by the Elizabethtown Water Company.

Ref. Nos. 23; 30

Is a designated wellhead protection area within 4 miles of the site?

A wellhead protection area has not been delineated within a 4-mile radius of the site.

Ref. Nos. 23; 31

Does a waste source overlie a designated or proposed wellhead protection area? If a release to groundwater is observed or suspected, does a designated or proposed wellhead protection area lie within the contaminant boundary of the release?

A wellhead protection area has not been delineated; therefore, neither the site nor the waste sources at the site overlie a wellhead protection area.

Ref. Nos. 4; 23; 31

9. Identify one of the following resource uses of groundwater within 4 miles of the site (i.e., commercial livestock watering, ingredient in commercial food preparation, supply for commercial aquaculture, supply for major, or designated water recreation area, excluding drinking water use, irrigation (5-acre minimum) of commercial food or commercial forage crops, unusable).

Groundwater within a 4-mile radius of the site is used for industrial, and irrigation purposes. It is unknown if irrigation usage is in excess of five acres.

Ref. Nos. 23; 32, pp. 3, 7, 9, 11

SURFACE WATER ROUTE

- 10. Describe the likelihood of a release of contaminant(s) to surface water as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence and relationship to background.**

A release to surface water is not observed or suspected. On 14 February 1986, 9 January 1989, and 13 September 1989, silver chloride was discharged to into the facility's NJPDES (No. NJ0034835) permitted outfall. During the ECRA investigation, the discharge area was designated as Area E and sampled on 23 April 1987. Additional sediment sampling was conducted on 16 March 1989, 6 April 1989, and 22 September 1989 to further delineate the extent of silver contamination and to address the subsequent spills. Sediment was excavated from Area E between 27 November and 4 December 1990 and between 17 June and 2 July 1991 and transported to Pennsauken Solid Waste Management Authority, New Jersey. Post-excavation samples were collected and analyzed for silver. Analytical results did not indicate the presence of silver in any of the samples collected.

Ref. Nos. 4, pp. 72, 133, 238-244, 250-252, 482-485, 545-551; 14, pp. 19-20, 23; 19, pp. 3-8

- 11. Identify the nearest down slope surface water. If possible, include a description of possible surface drainage patterns from the site.**

The nearest down slope surface water and probable point of entry (PPE) is a drainage ditch located adjacent to the northwestern corner of the facility. The most probable drainage pattern is northwest toward the drainage ditch through on-site channels. The drainage ditch joins an unnamed tributary of Bound Brook approximately 0.4 mile north of the site. The unnamed tributary flows north toward Bound Brook for approximately 0.9 mile. Bound Brook flows west for approximately 5.2 miles, where it enters the Green Brook. The Green Brook enters the Raritan River, approximately 2.8 miles south of the Green Brook-Bound Brook confluence. The remainder of the 15-mile surface water migration pathway follows the Raritan River for approximately 5.7 miles. The target distance limit is approximately 0.4 mile east of the Landing Lane Bridge.

Ref. Nos. 2, pp. 1, 5-6; 4, p. 653; 24

- 12. What is the distance in feet to the nearest down slope surface water? Measure the distance along a course that runoff can be expected to follow.**

The distance from the site to the drainage ditch is approximately 0 feet. The drainage ditch is located adjacent to the northwest corner of the site.

Ref. Nos. 2, pp. 1, 5; 4, p. 653; 24

13. Identify all surface water body types within 15 downstream miles.

<u>Name</u>	<u>Water Body Type</u>	<u>Flow (cfs)</u>	<u>Saline/Fresh/Brackish</u>
Drainage Ditch	Minimal Stream	<10	Fresh
Unnamed Tributary	Minimal Stream	<10	Fresh
Bound Brook	Moderate Stream	77.1	Fresh
Green Brook	Small Stream	10.5	Fresh
Raritan River	Large River	1,173.5	Fresh

Ref. Nos. 2, p. 2; 24; 28, p. 6; 33, 3-7

14. Determine the 2 yr, 24 hr rainfall (inches) for the site.

The 2-year, 24 hour rainfall for the site is approximately 3.5 inches.

Ref. No. 34

15. Determine size of the drainage area (acres) for sources at the site.

The majority of the facility is covered with asphalt, concrete, or buildings, with the exception of Area D. Area D is approximately 200 feet by 330 feet, or 1.52 acres, and is bounded by a building to the north, concrete to the east, an asphalt parking lot to the south, and a drainage ditch to the west. Based upon these considerations, the drainage area for the site is estimated at 1.52 acres.

Ref. Nos. 2, pp. 4-5; 4, pp. 568, 570, 573-574; 24

16. Describe the predominant soil group in the drainage area.

The predominant soil group in the drainage area is the Klinesville Loam. Klinesville soils are reddish, moderately coarse textured soils, containing much soft shale fragments especially in the lower part of the profile.

Ref. Nos. 24; 29, pp. 1-3

17. Determine the type of floodplain that the site is located within.

The site is located in an area of minimal flooding (i.e., outside the 500-year flood boundary).

Ref. No. 35

18. Identify drinking water intakes in surface waters within 15 miles downstream of the point of surface water entry. For each intake identify: the name of the surface water body in which the intake is located, the distance in miles from the point of surface water entry, population served, and stream flow at the intake location.

There are no drinking water intakes located along the 15-mile target distance limit (TDL) of the site.

Ref. Nos. 24; 30

19. Identify fisheries that exist within 15 miles downstream of the point of surface water entry. For each fishery specify the following information:

<u>Fishery Name</u>	<u>Water Body Type</u>	<u>Flow (cfs)</u>	<u>Saline/Fresh/Brackish</u>
Bound Brook	Moderate Stream	77.1	Fresh
Green Brook	Small Stream	10.5	Fresh
Raritan River	Large River	1,173.5	Fresh

Ref. Nos. 2, p. 2; 24; 28, p. 6; 33, 3-7; 36, pp. 2-11

20. Identify surface water sensitive environments that exist within 15 miles of the point of surface water entry.

<u>Environment</u>	<u>Water Body Type</u>	<u>Flow (cfs)</u>	<u>Wetland Frontage</u>
Drainage Ditch (wetlands)	Minimal Stream	<10	0.3
Unnamed Tributary (wetlands)	Minimal Stream	<10	0.2
Bound Brook (wetlands)	Moderate Stream	77.1	10.7
Green Brook (wetlands)	Small Stream	10.5	2.4
Raritan River (wetlands)	Large River	1,173.5	4.6
State-listed endangered species (1)	Large River	1,173.5	N/A
State designated area for protection or maintenance of aquatic life	Minimal Stream	<10	N/A
State designated area for protection or maintenance of aquatic life	Minimal Stream	<10	N/A
State designated area for protection or maintenance of aquatic life	Moderate Stream	77.1	N/A

20. Continued

<u>Environment</u>	<u>Water Body Type</u>	<u>Flow (cfs)</u>	<u>Wetland Frontage</u>
State designated area for protection or maintenance of aquatic life	Small Stream	10.5	N/A
State designated area for protection or maintenance of aquatic life	Large Stream	1,173.5	N/A

Ref. Nos. 2, p. 2; 21; 22; 24; 28, pp. 6, 9; 33, 3-7; 36, pp. 5-11

21. If a release to surface water is observed or suspected, identify any intakes, fisheries, and sensitive environments from question Nos. 18-20 that are or may be actually contaminated by hazardous substance(s) attributed to an observed release of from the site.

A release to surface water is not observed or suspected. Refer to Question 10 for a description of the likelihood of a release to surface water.

Ref. Nos. 4, pp. 72, 133, 238-244, 250-252, 482-485, 545-551; 14, pp. 19-20, 23; 19, pp. 1-6

22. Identify whether the surface water is used for any of the following purposes, such as: irrigation (5 acre minimum) of commercial food or commercial forage crops, watering of commercial livestock, commercial food preparation, recreation, potential drinking water supply.

Surface water from Bound Brook, Green Brook, and Raritan River are used for recreation purposes.

Ref. Nos. 24; 36, pp. 5, 9-11

SOIL EXPOSURE PATHWAY

- 23. Determine the number of people that occupy residences or attend school or day care on or within 200 feet of observed contamination.**

There are no residences, schools, or day care facilities located on or within 200 feet of the site.

Ref. Nos. 2, pp. 1-6; 4, pp. 470-481, 486-487, 559-584

- 24. Determine the number of people that regularly work on or within 200 feet of observed contamination.**

There are approximately 310 people employed by Degussa Corp. The ECRA investigation identified 4 areas of concern, including Areas A through D. Areas A, B, and C are currently covered with cement or asphalt and Area D is not an active portion of the facility.

Ref. Nos. 2, pp. 1-6; 4, pp. 470-481, 486-487, 559-584; 7, p. 72

- 25. Identify terrestrial sensitive environments on or within 200 feet of observed contamination.**

There are no known terrestrial sensitive environments on or within 200 feet of the area of observed contamination.

Ref. Nos. 4, pp. 470-481, 486-487, 559-584; 20, p. 6; 21; 22; 23

- 26. Identify whether there are any of the following resource uses, such as commercial agriculture, silviculture, livestock production or grazing within an area of observed or suspected soil contamination.**

There are no commercial agriculture, silviculture, livestock production, or grazing on or within an area of observed or suspected soil contamination.

Ref. Nos. 2, pp. 1-6; 3; 4

AIR PATHWAY

27. Describe the likelihood of release of hazardous substances to air as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them the site. For observed release, define the supporting analytical evidence and relationship to background.

A release of contaminants to the air is not observed or suspected. There are no known analytical data available to determine if a release from the site to the air has occurred. The facility currently maintains 36 stacks that vent to the atmosphere under Facility-Wide Permit No. NJ00010. Although background information indicates that the facility has been cited for brief emissions in the past, no odors or visual emissions were noted during the Region II START off-site reconnaissance.

Ref. Nos. 2, pp. 1-4; 4, pp. 393-394, 396-402; 9, pp. FAC-1, 2-5; 10

28. Determine populations that reside within 4 miles of the site.

<u>Distance</u>	<u>Population</u>
On site (workers)	310
>0 - ¼ mi	230
>¼ - ½ mi	1,318
>½ - 1 mi	5,387
>1 - 2 mi	25,663
>2 - 3 mi	58,138
>3 - 4 mi	79,893

A total of 170,939 persons reside within a 4-mile radius of the site.

Ref. Nos. 2, pp. 1-6; 7, p. 72; 23; 25, pp. 16-17

29. Identify sensitive environments, including wetlands and associated wetlands acreage, within 4 miles of the site.

<u>Distance</u>	<u>Wetlands Acreage</u>	<u>Sensitive Environments</u>
On-site	0	None identified
0 - ¼ mi	3.5	None Identified
>¼ - ½ mi	2,247.5	None Identified
>½ - 1 mi	113	None Identified
>1 - 2 mi	504	None Identified
>2 - 3 mi	616.5	None Identified
>3 - 4 mi	488	State Endangered (5) State Threatened (2)

Ref. Nos. 21; 22; 23

30. If a release to air is observed or suspected, determine the number of people that reside or are suspected to reside within the area of air contamination from the release.

A release to air is not observed or suspected; see question No. 27 for a description of likelihood of a release.

Ref. Nos. 2, pp. 1-4; 4, pp. 393-394, 396-402; 9, pp. FAC-1, 2-5; 10

31. If a release to air is observed or suspected, identify any sensitive environments, listed in question No. 29, that are or may be located within the area of air contamination from the release.

A release to air is not observed or suspected; see question No. 27 for a description of likelihood of a release.

Ref. Nos. 2, pp. 1-4; 4, pp. 393-394, 396-402; 9, pp. FAC-1, 2-5; 10

ATTACHMENT 1

PHOTOGRAPH LOG

METZ METALLURGICAL CORP.
SOUTH PLAINFIELD, MIDDLESEX COUNTY, NEW JERSEY

OFF-SITE RECONNAISSANCE: 21 MAY 1999

**METZ METALLURGICAL CORP.
SOUTH PLAINFIELD, MIDDLESEX COUNTY, NEW JERSEY
OFF-SITE RECONNAISSANCE
21 MAY 1999**

PHOTOGRAPH INDEX

All Photographs taken by Kiersten Dorneman

<u>Logbook Photo No.</u>	<u>Description</u>	<u>Time</u>
1	View of Areas D and E, facing south, located on the northwest portion of the site.	1100
2	Western (rear) side of the facility, facing east.	1105
4	Discharge pipe to the drainage ditch at the northwest corner of the facility, location of the probably point of entry (PPE), facing west.	1125
7	View of the drainage ditch and the unnamed tributary of the Bound Brook confluence.	1300



Photo 1 View of Areas D and E, facing south, located on the northwest portion of the site.

1100



Photo 2 Western (rear) side of the facility, facing east.

1105



Photo 4 Discharge pipe to the drainage ditch at the northwest corner of the facility, location of the probably point of entry (PPE), facing west.

1125



Photo 7 View of the drainage ditch and the unnamed tributary of the Bound Brook confluence.

1300

ATTACHMENT 2

REFERENCES

REFERENCES

1. U.S. Environmental Protection Agency (EPA) Superfund Program, Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), List-8I: Site/Action Listing, p. 234, 14 April 1999.
2. Field Logbook No. START-02-383, for Metz Metallurgical, South Plainfield, New Jersey, TDD No. 02-98-09-0011, Region II START, Edison, New Jersey, Off-site Reconnaissance, conducted on 21 May 1999.
3. Real Property Tax List, South Plainfield Boro, Middlesex County, New Jersey, pp. 543-545, 1998.
4. Site Inspection, Metz Metallurgical (aka: Degussa/Degrassa Corporation), South Plainfield, Middlesex County, prepared by the New Jersey Department of Environmental Protection and Energy (NJDEPE), Division of Responsible Party Site Remediation, Bureau of Site Assessment, 3 September 1991.
5. Latitude and Longitude Calculation Worksheet #2, Metz Metallurgical Corp., Kiersten Dorneman, Region II START, 17 November 1998.
6. Facility Report for Degussa Corp., Metz Division, Facility No. 0099525, compiled by NJDEP, Division of Responsible Party Site Remediation, 29 October 1999.
7. Project Note from Kiersten Dorneman, Region II START, to Metz Metallurgical Corp. Site File, Subject: Inspections, 26 October 1999; with attachments.
8. Notification of Hazardous Waste Activity, Metz Metallurgical Corporation, 15 August 1980.
9. Letter from Robert C. Shinn Jr., Commissioner, and Gary Sondermeyer, Assistant Commissioner, Office of the Commissioner, New Jersey Department of Environmental Protection (NJDEP), to Mr. James Leahy, Environmental Control Manager, Degussa Corporation, 15 June 1998; with attachments.
10. Project Note from Kiersten Dorneman, Region II START, to Metz Metallurgical Corp. Site File, Subject: Releases, 27 October 1999; with attachments.
11. Analytic Results for Soil Sampling at Metz Metallurgical Corporation, 3900 South Clinton Avenue, South Plainfield, NJ, ECRA Case #86108, prepared by Environics Incorporated/Environmental Consultants, 31 July 1987.
12. Letter from Kenneth T. Hart, Acting Assistant Director, Industrial Site Evaluation Element, Division of Hazardous Waste Management, NJDEP, to Mr. Paul B. Dahlgren, CH2M Hill, Subject: Industrial Establishment: Metz Metallurgical Corporation, 26 April 1991.

REFERENCES (CONTINUED)

13. Letter from Tessie W. Fields, Acting Section Chief, Bureau of Environmental Evaluation and Cleanup Responsibility Assessment, Division of Hazardous Waste Management, NJDEP, to Mr. Paul Dahlgren, CH2M Hill, Subject: Metz Metallurgical Corp., 6 August 1991.
14. Final Report for Metz Metallurgical Corporation, 3900 South Clinton Avenue, South Plainfield, New Jersey, ECRA Case No. 86108, prepared by CH2M Hill, May 1992.
15. ECRA Case Summary for Metz Metallurgical Corp., Case No. 86108, printed on 30 October 1992; with attachments.
16. Letter from Kevin T. Aiello, Administrator, Environmental Quality, Middlesex County Utilities Authority, to Mr. James D. Leahey, Environmental Control Manager, Degussa Corporation/Metal Group, Subject: Degussa Corporation, Metz Division, Building A-C, MCUA Permit No.: 24055, 5 October 1995; with attachments.
17. Letter from Paul B. Dahlgren, Project Manager, CH2M Hill, to John Kosher, Case Manager, Cleanup Oversight, Bureau of Environmental Evaluation and Cleanup Responsibility Assessment, Division of Hazardous Waste Management, NJDEP, Subject: Monthly Progress Report for Metz Metallurgical Corporation, South Plainfield, New Jersey, ECRA Case # 86108, 14 June 1991; with attachments.
18. Soil Screening Guidance: Technical Background Document, Second Edition, Superfund, Office of Solid Waste Management and Emergency Response, EPA, May 1996.
19. Monthly Progress Report, Metz Metallurgical Corporation, South Plainfield, New Jersey, ECRA Case #86108, Report No. 03, 15 August 1991.
20. The EDR-Radius Map with GeoCheck®, Metz Metallurgical Corp, 3900 South Clinton Ave, South Plainfield, NJ, 07080, Inquiry No. 1441071.1p, prepared by Environmental Data Resources, Inc., 7 December 1999.
21. Project Note from Kiersten Dorneman, Region II START, to Metz Metallurgical Corp. Site File, Subject: Sensitive Environments, 3 August 1999; with attachments.
22. Project Note from Kiersten Dorneman, Region II START, to Metz Metallurgical Corp. Site File, Subject: Wetland Frontage and Acreage, 24 May 1999.
23. Four-Mile Vicinity Map for Metz Metallurgical Corp. Site, South Plainfield, Middlesex County, NJ, compiled from U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5-minute series, Quadrangles for Plainfield, NJ, 1955, photorevised 1981; Bound Brook, NJ, 1955, photorevised 1970, photoinspected 1977; and Perth Amboy, NJ, 1956, photorevised 1981.

REFERENCES (CONTINUED)

24. Fifteen-Mile Surface Water Pathway Map for Metz Metallurgical Corp. Site, South Plainfield, Middlesex County, NJ, compiled from U.S. Department of the Interior, Geological Survey Maps, 7.5-minute series, Quadrangles for Plainfield, NJ, 1955, photorevised 1981; Bound Brook, NJ, 1955, photorevised 1970, photoinspected 1977; and Perth Amboy, NJ, 1956, photorevised 1981.
25. Letter from Bob Frost, Frost Associates, to Diane Minsavage, Region II START, Subject: S. Plainfield, NJ, 27 November 1998.
26. EPA, Office of Ground Water and Drinking Water, National Primary Drinking Water Regulations, Current Drinking Water Standards, 12 October 1998.
27. Michalski, Andrew, "Hydrogeology of the Brunswick (Passaic) Formation and Implications for Ground Water Monitoring Practice," Ground Water Monitoring Report, Fall 1990.
28. Federal Register, EPA, 40 CFR Part 300, Hazard Ranking System; Final Rule, Volume 55, No. 241, 14 December 1990.
29. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Middlesex County, New Jersey, issued February 1976.
30. Project Note from Kiersten Domeman, Region II START, to Metz Metallurgical Corp. Site File, Subject: Public Supply Wells, 15 December 1999; with attachments.
31. Telecon Note: Conversation between Steve Spayd, NJGS, and Diane Minsavage, Region II START, 3 June 1999.
32. Letter from Kathleen Hibbs, U.S. Geological Survey, Water Resources Division, to Gerald Gilliland, Region II START, Subject: Ground-Water Data, 25 May 1999.
33. Water Resources Data, New Jersey, Water Year 1996, U.S. Geological Survey, Water-Data Report NJ-96-1, 1997.
34. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years, Technical Paper No. 40.
35. Federal Emergency Management Agency, National Flood Insurance Program, Flood Insurance Rate Map (FIRM), Borough of South Plainfield, New Jersey, Middlesex County, Panel 3 of 5, Community-Panel Number: 340279 0003 B, Effective Date 1 August 1980.
36. NJDEP, Office of Environmental Planning, Surface Water Quality Standards, N.J.A.C. 7:9B, April 1998.

REFERENCE 1

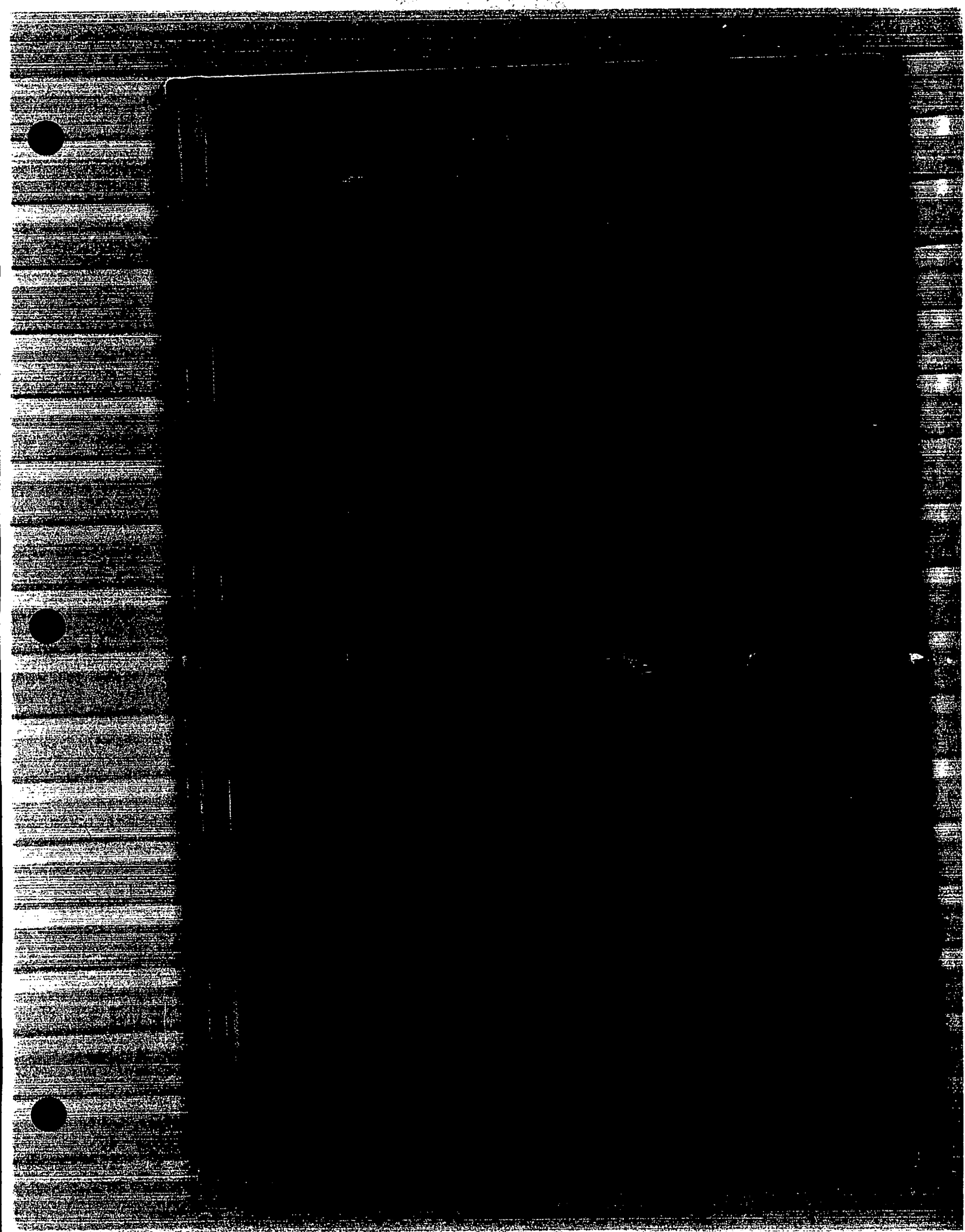
Run Date: 4/1
 Sequence: State, Site Name
 Report name: L8I_alpha

HOC
 U.S. EPA Superfund Program
 Region II
 List-8I Site/Action Listing

Page
 Internal Use Only

EPA ID	Site Name Address City Zip County Name\Code	Cong Dist	NFRAP Flag	Oprble Unit	Action Type	Action Lead	Action Qualif	Actual Start Date	Actual Compl Date
NJD981144033	METRO LTD. MELANIE LANE EAST HANOVER 07936 MORRIS 027	11	NFA						
				00	DS 001	S			06/27/86
					PA 001	S	H	06/27/86	06/30/86
					SH 001	F	N		09/30/92
					SI 001	F	N	07/01/91	09/25/91
NJD002195303	METZ METALLURGICAL CORP. 3900 SOUTH CLINTON AVE. SOUTH PLAINFIELD 07080 MIDDLESEX 023	06							
				00	DS 001	F			06/06/89
					PA 001	F	D		07/20/89
					SH 001	F		09/03/98	
					SI 001	S	L	07/01/91	09/24/91
NJD986595015	MICHAEL CERVINO REAR OF 179 GODWIN AVE WYCKOFF 07481 BERGEN 003	05	NFA						
				00	DS 001	F			10/01/90
					PA 001	F	L	10/01/90	12/31/90
					SI 001	F	N	07/01/91	09/25/91
NJD981490287	MICHAEL DESKOVICK LANDFILL KLINGER ROAD EAST HANOVER 07936 MORRIS 027	11							
				00	DS 001	S			06/27/86
					PA 001	S	L	06/27/86	06/30/86
					SI 001	F		05/27/98	
NJD063161129	MIDDLESEX INDUSTRIAL CENTER MOUNTAIN AV & LEHIGH VALLEY MIDDLESEX 08846 MIDDLESEX 023	05							
				00	DS 001	F			06/01/81
					PA 001	S	L	09/28/87	09/29/87
					SI 001	S	H	04/01/91	06/27/91

REFERENCE 2



Metz Metallurgical Corp.
Smith Plainfield, New Jersey
TDD No. 02-98-09-0011
Region II START
Edison, NJ

National[®] Brand

Green Book Cliché

Item No.

Item No. 56-521

Item No. 56-522



AVERY
DENNISON

Made in USA

Avery is committed to providing
any product with
comments and

21 May 1999, Friday

0920 START members D. Minsavage, S. Quinn and K. Dorneman arrived at the Middlesex Co. tax office. Tax ~~map~~^(ED) maps and records were reviewed. The lot and block numbers reported in the SI report were confirmed. The tax information was photocopied.

1100 Arrived at site to perform off-site recon. Looking at the rear of the site → areas A, E, and D. The drainage ditch has liquid in it. There is a small building (pump house?) located in area D. There is running water flowing in a drainage ditch from the pump house toward the property line. The property is surrounded by a 10' high chain link fence, topped with barbed wire.

Photo #1 - Areas E and D, facing South. shows the small building and the drainage ditch.

Storm water runoff appears to flow toward the ~~eastern~~^{western} boundary of the property and is controlled by the drainage ditch.

1105 Photo #2 - Facing east, toward the rear of the facility → facility is active. Appears that there are empty (?) ~~but~~^(ED) unused tanks located on concrete within the active portion of the facility. These tanks are disconnected.

The SW corner of the facility is bordered by property owned by Degussa (aka Metc) → this is a concrete area. On this area something is covered by a black tarp. A large container (trash bin(?)) is also

located on the concrete area there are several rolls of chain link fencing and neatly stacked cement ^(K9) parking space markers. ^(K9)

Within the area D → a pile of ^(K9) top soil (?) is located on the SW corner

1115 Photo #3 - pile covered w/ black tarp facing South, located on cement area South of fenced property

The flow of the drainage ditch where it leaves the property ~ 1 ft/s, depth approx. 3", varied width 1.5 to 3'

Approx. 30 yards N. of the ^(K9) site a pipe enters the drainage ditch Warner-Jenkinson is located NE of the facility (adjacent to)

1125 Photo #4 facing ^(K9) W, showing the discharge pipe to the drainage ditch from the facility

Warner-Jenkinson Co., Inc. → Cosmetic Coloss ^(K9) and pharmaceutical ingredients Located at 107 Wade Ave.

Across Wade Ave is located Therma Systems (to the N of the site) a division Seco Products, Corp. Located at 100 Wade Ave

Also located at 100 Wade Ave →

~~Office~~ Del-Med, Inc. and

Reed Productions Inc. (RPI) ^(K9) NE

1130 Degussa is also located catty corner from the site (Bldg. D) and LR Metal treating is located E of the site (across Clinton Ave)

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Banc

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to SK

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chain link fencing
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→ a pile of ^{to} top
on the SW corner
w/ black tarp facing
cement area
property

ing ditch where
by ~ 1 ft/s, depth
in 1.5 to 3'

of the ^{to} prop site

ing ditch

located NE of

to

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ravage ditch from

o, Inc → Cosmetic
aceutical ingredients
Wade Ave.

is located
to the N. of the
2co Products, Corp.

Wade Ave

oo Wade Ave →

inc. and

c. (RPI) ^{to} NE

ted catty corner from

LR Metal treating is

to (across Clinton

1130 East of Bldg D. Degussa → adjacent to and
east of Bldg. D is Freihofers Bakery out to
LR Metal → appears to be inactive.

South of the site → located: American Metal
adjacent to the site. There is a home that
is ^{to} does not appear to be lived in.

(K) SW, as West of the facility is J. Anthony
Equipment Co. at 4201 S. Clinton Ave.
(across from Metz)

Full name of American Metal → American
Metal Warehouse Co, Inc.

East of the facility is J & H Berge, Inc.,
Scientific Supply, located at 4111 S. Clinton.
(^{to} across from Bldg. A of Metz)

Appears as if monitoring wells are still open.
Greater than 300 cars in the parking lot.

There are storm drains located E of the
facility on Clinton; however they are
located up gradient. Slope appears to
be westerly.

Wade Ave. → N. side of the warehouse
(loading area) - 2 waste bins, ^{to} in
cement area, labeled Statewide Env't.

Contractors, 908. 561-8380 - appear to
accept waste from 2 blue chutes, ^{to} waste
is unknown.

Western edge of the property is boarded by
wooded area, beyond which is a plowed field,
unknown what is planted.

1216 Photo #5 Cattails in the unnamed trib. to
Round Brook

1230 Photo #6 - playground located ^{off} site, w/ children
adjacent ^{to} SW corner of facility (beyond cement pad)

1235 - Searching for the connection to the unnamed trib. Observed several outfalls to the ~~off~~ ditch. Still has ~~slow~~ flow.

1300 - Found confluence

Photo #7 - Photo of confluence of ditch and stream

Confluence is located directly W. of Binder Machinery Co. in ~~Indiana~~ ~~Industrial Park on Davis St. St. KY~~ Located at 3300 ~~off~~ S Clinton near Davis St. (0.4 mi. from ^{corner of} warehouse - Metz)

1325 Finished off site recon.

Summary:

The facility is active and there were no odors or visual emissions observed. Areas A & C are now paved w/ concrete and asphalt, respectively. The playground is located off-site, greater than 200' away from site boundaries. There are no schools and/or residences located w/in 200' of site. There are over 300 cars (approx.) within the site parking lot. A continuous ^{flow of water} was observed leaving the facility property via the drainage ditch to the off-site ditch.

Kristi
5/21/99

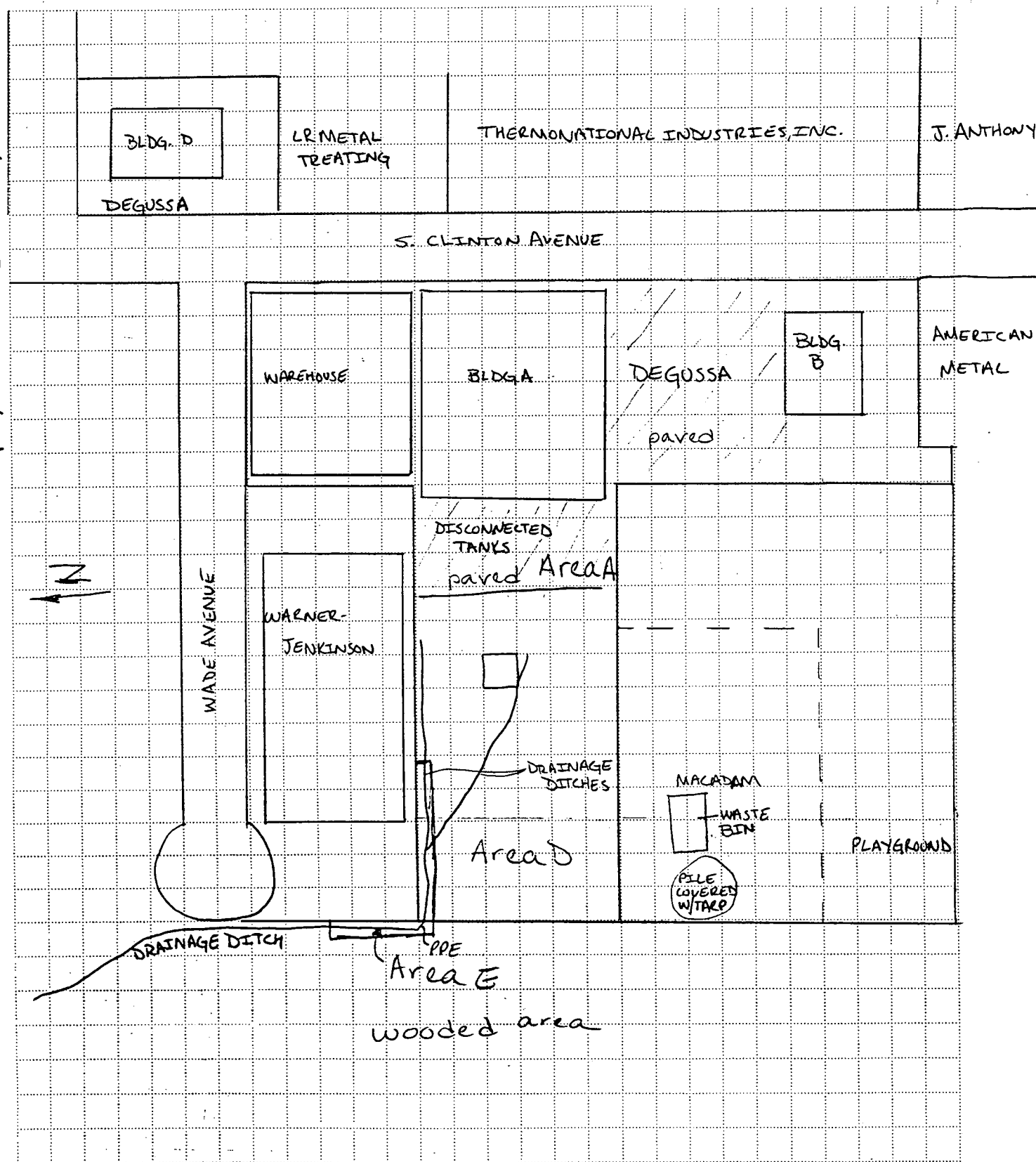
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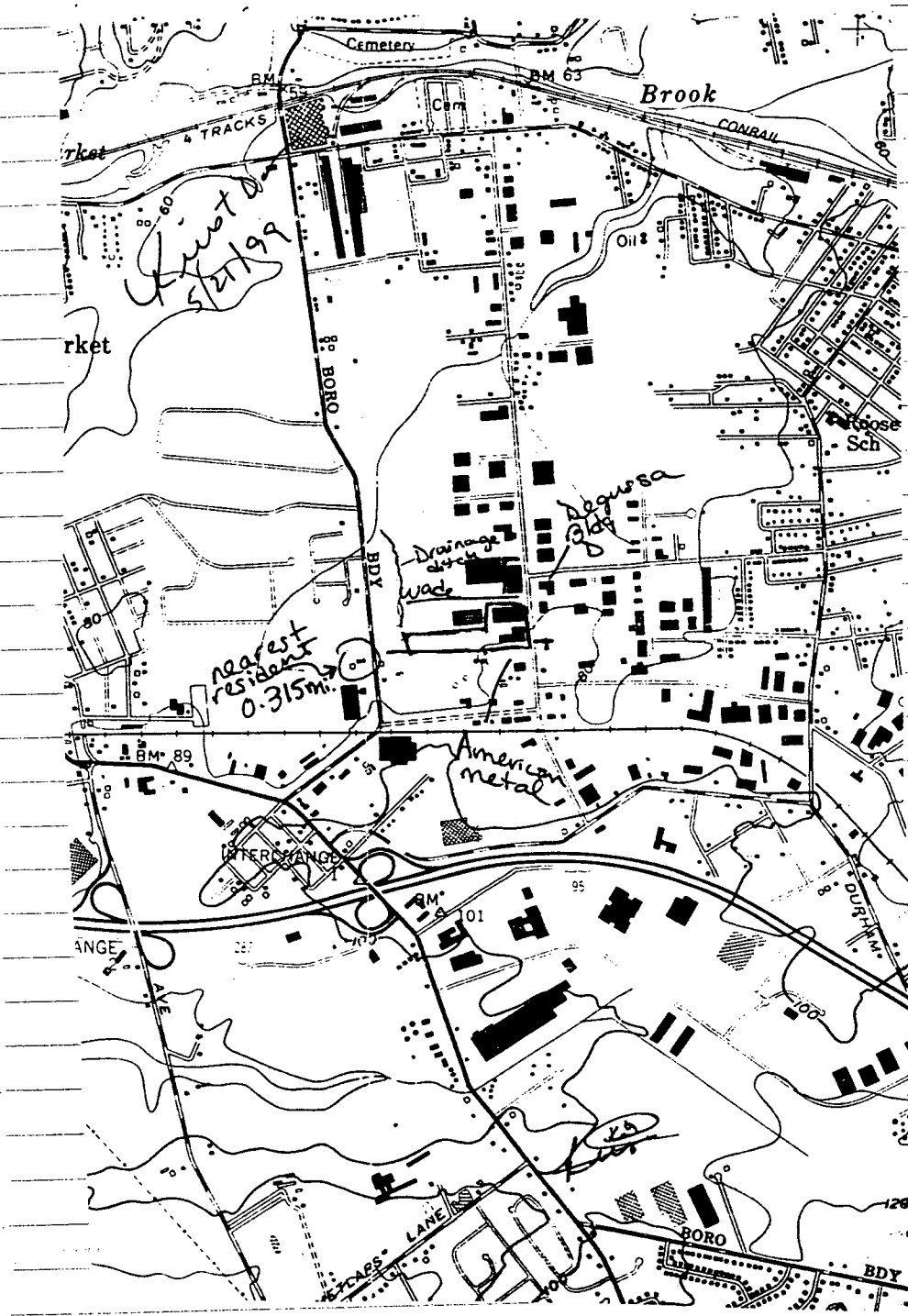
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Kristen-D
5/21/99





REFERENCE 3

1	2	3	4	5	6	7	8	9	10	11	12
BLOCK NO. LOT NO. QUALIFICATION ACCOUNT NO.	LAND DIMENSIONS Building Description ADDITIONAL LOTS ACREAGE	Prop. Class.	OWNER'S NAME ADDRESS CITY STATE PROPERTY LOCATION ZONING	BILLING CODE ZIP CODE Tax Map Page	LAND IMPROVEMENTS TOTAL VALUE	EXEMPTIONS CODE AMOUNT	NET TAXABLE VALUE	DEDUCTIONS CODE NO. DEDUCT.	NO. OWNERS	SPECIAL TAX CODE	HOUSING TAX CODE
463 2	50X100EL .1148	1	ANTANGELEA, VINCENTO & HARRIS WALT 1640 NEW MARKET AVE SOUTH PLAINFIELD, N.J. SEYMOUR AVE	07080 M3	5200 0 5200		5200				
464 2	50X100EL .1148	1	CHICARELL, MARY 2711 NEW BRUNSWICK AVE SOUTH PLAINFIELD NJ MIDDLESEX AVE	07080 M3	5200 0 5200		5200				
464 3	50X311 10S WC 0G 01F .3570	2	CHICARELLI, NORMAN & MARILYN 18 JERSEY STREET SOUTH PLAINFIELD, NJ 1800 JERSEY ST	07080 M3	26500 49400 75900		75900				
464 4	50X210 105A2SWC1G1F .2410	2	CHICARELLI, MARY 2711 NEW BRUNSWICK AVE SOUTH PLAINFIELD NJ 2711 NEW BRUNSWICK AVE	07080 M3	23400 38600 62000		62000				
464 6	100X309 105A2SWS2G1F .7094	2	REA, JOSEPH J. 225 WALTER ST. SOUTH PLAINFIELD, NJ 2701 NEW BRUNSWICK AVE	07080 M3	36100 47900 84000		84000				
465 1 QFARM	1.45AC 1.4500	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVENUE SOUTH PLAINFIELD, N.J. MIDDLESEX-JERSEY	07080 M3	100 0 100		100				
466 1 QFARM	1.27AC 1.2700	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVENUE SOUTH PLAINFIELD, N.J. UNION & NEWARK	07080 M3	100 0 100		100				
467 1 QFARM	14.5AC 14.5000	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVE SOUTH PLAINFIELD, N.J. NEW BRUNSWICK AVE	07080 M3	7900 0 7900		7900				
467 2	180X159 20S AL 1G 01F .6570	2	BRADLEY, EDWIN & ELIZABETH M. 192 LAKEVIEW AVENUE PISCATAWAY, N.J. 3025 NEW BRUNSWICK AVE	08854 M3	38700 59400 98100		98100				
467 3 QFARM	1.35AC 1.3500	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVENUE SOUTH PLAINFIELD, N.J. UNION ST	07080 M3	100 0 100		100				
467 4 QFARM	1.26AC 1.2600	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVENUE SOUTH PLAINFIELD, N.J. UNION ST	07080 M3	100 0 100		100				
467 5 QFARM	.51AC .5100	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVE SOUTH PLAINFIELD, N.J. ROOSEVELT AVE	07080 M3	100 0 100		100				
467 21 QFARM	57.53AC 57.5300	3B	HARRIS STRUCTURAL STEEL CO. 1640 NEW MARKET AVE SOUTH PLAINFIELD, N.J. NEW BRUNSWICK AVE	07080 M3	4700 0 4700		4700				
467.01 28	4.4960 AC 4.4960	4B	DEGUSSA CORPORATION 3900 SOUTH CLINTON AVE SOUTH PLAINFIELD, NJ 3949 APGAR STREET	07080 M3	369700 21500 391200		391200				

1 LINE NUMBER	2 BLOCK NO. LOT NO. QUALIFICATION ACCOUNT NO.	3 LAND DIMENSIONS Building Description ADDITIONAL LOTS ACREAGE	4 OWNER'S NAME ADDRESS CITY STATE PROPERTY LOCATION ZONING	5 BILLING CODE ZIP CODE Tax Map Page	6 LAND IMPROVEMENTS TOTAL VALUE	7 EXEMPTIONS		8 NET TAXABLE VALUE	9 DEDUCTIONS			10 SPECIAL TAX CODES		11 HOMESTEAD		12 VETERAN'S PRIORITY
						CODE	AMOUNT		CODE	NO. DEDUCT.	NO. OWNERS			QUALITY	ADJUSTMENT	
1	467.01 29.02	9.247 AC 9.2470	4B METZ METALLURGICAL CORP. 3900 SOUTH CLINTON AVE. SOUTH PLAINFIELD, NJ 3900 SOUTH CLINTON AVE	* 07080 M3	766300 1733700 2500000			2500000						0	00	
2	467.01 31	3.34 AC 3.3400	4B THE WEINER PARTNERSHIP 4216 SOUTH CLINTON AVE SOUTH PLAINFIELD, NJ 4216 SOUTH CLINTON AVE	07080 M3	295300 417000 712300			712300								
3	467.01 32	2.3 AC 2.3000	4B DENTE, ROSEANNE 1127 IRVING AVE WESTFIELD, NJ 75 TYLER PLACE	07090 M3	217000 66500 283500			283500								
4	467.01 33	1.30 AC 1.3000	4B BRO-MAL REALTY, L.L.C. 85 TYLER PLACE SOUTH PLAINFIELD, NJ 85 TYLER PLACE	07080 M3	127000 245900 372900			372900								
5	467.02 1.01	1.465 1.4650	4B SP FIDELCO I, LLC 981 U.S.HWY 22 POB X 6872 BRIDGEWATER, NJ 3480 SOUTH CLINTON AVE	01554 08807 M3	141800 449800 591600			591600								
6	467.02 1.02	.736 .7360	4B SP FIDELCO I, LLC 981 U.S.HWY 22 POB X 6872 BRIDGEWATER, NJ 3 CENTURY ROAD	01554 08807 M3	87000 329400 416400			416400								
7	467.02 1.03	1.859 1.8590	4B SP FIDELCO I, LLC 981 U.S.HWY 22 POB X 6872 BRIDGEWATER, NJ 5 CENTURY ROAD	01554 08807 M3	176900 634100 811000			811000								
8	467.02 2	9.01 9.0100	4B NORTHEASTERN PRODUCTS COMPANY CAMPBELL SOUP CO. TAX DEPT CAMDEN, NJ 3500 SOUTH CLINTON AVE	08103 M3	656200 593800 1250000			1250000								
9	467.02 3	2.8 2.8000	15C BOROUGH OF SOUTH PLAINFIELD 2480 PLAINFIELD AVE SOUTH PLAINFIELD, N.J. 0000 SOUTH CLINTON AVE	07080 M3	262000 0 262000			*EXEMPT*								
10	467.03 1	3.135 3.1350	4B SP FIDELCO I, L.L.C. 981 RTE 22 PO BOX 6872 BRIDGEWATER, NJ 3474 SOUTH CLINTON AVE	08807 M3	288100 911900 1200000			1200000								
11	467.03 2	1250 SQ FT .2583	4B MERCIER ASSOCIATES, L.L.C. 3470 SOUTH CLINTON AVE SOUTH PLAINFIELD, NJ 3470 SOUTH CLINTON AVE	07080 M3	62900 162400 225300			225300								
12	467.04 1	2.82 2.8200	4B ESSEX REALTY COMPANY 414 ESSEX STREET HACKENSACK, NJ 2 INGERSOLL RD	07601 M3	263800 1422000 1685800			1685800								
13	467.04 2	2.60 2.6000	4B SORCE, SANTO V.C/O SVS REALTY 414 ESSEX STREET HACKENSACK, N.J. 3300 SOUTH CLINTON AVE	07601 M3	244000 1140000 1384000			1384000								
14	467.04 3	28,495 SF .65 AC.	1 SORCE, SANTO V. 414 ESSEX STREET HACKENSACK, N.J.	07601	16500 0 16500			16500								

